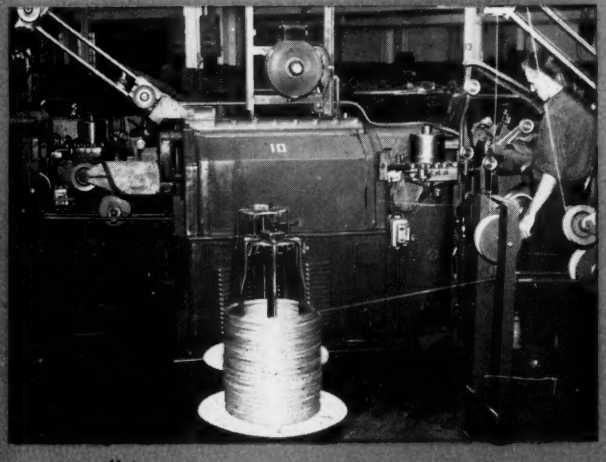
WIRE AND WIRE PRODUCTS

NOVEMBER 1953



"Quick on the Draw!"

Leading with the leaders in

Stainless Wire Production

Vaughn®

MOTOBLOC®
MOTOBLOX®

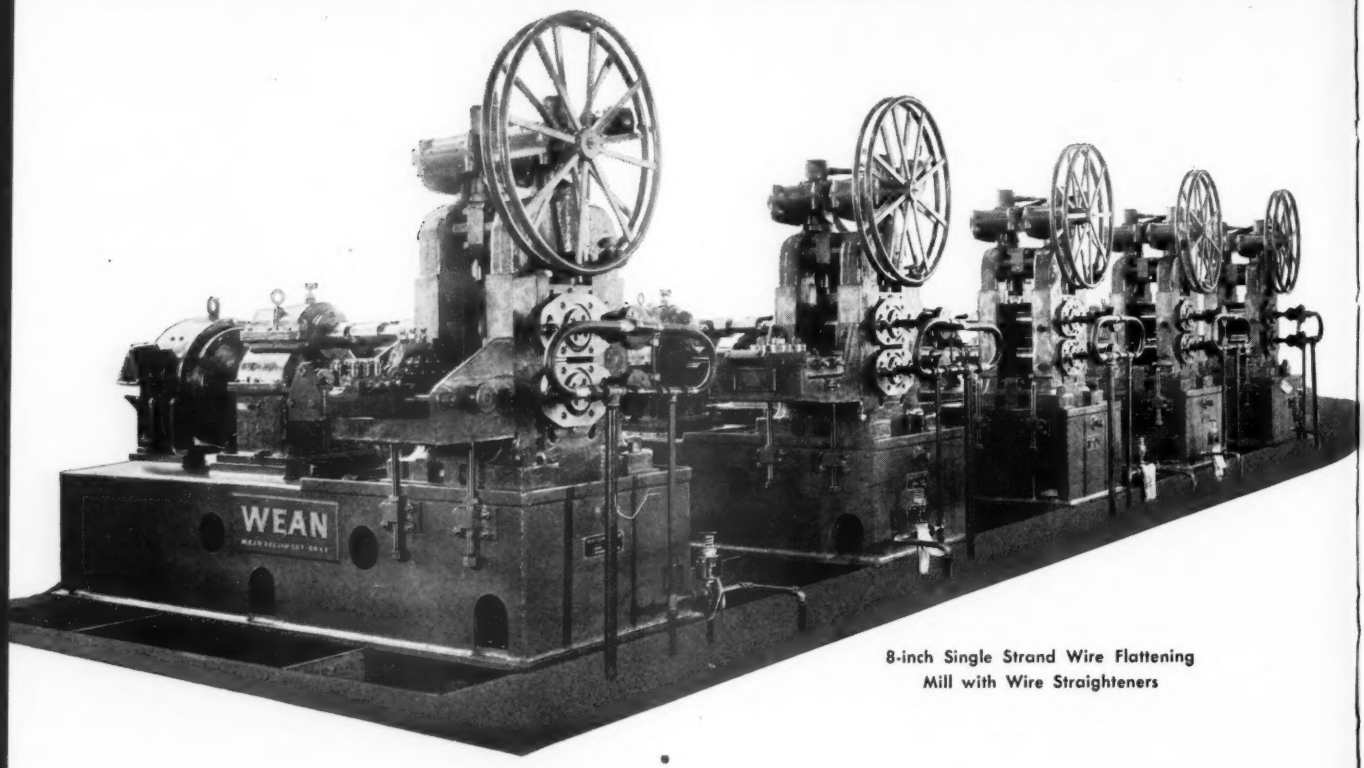
In the exacting business of high-speed stainless wire drawing, Vaughn Machines *deliver* for the foremost producers in America and abroad. Write!

THE VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single-Stile . . . for the Largest Bars & Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Wean



8-inch Single Strand Wire Flattening Mill with Wire Straighteners

A COMPLETE ENGINEERING SERVICE FOR WIRE MILL INSTALLATIONS

Complete Installations for Electro Galvanizing, Hot Dip Galvanizing, Patenting, Tinning, Wire Flattening, Nail Galvanizing and Blueing.

Complete Equipment for the Manufacture of Hexagon Netting, Hinge Joint Fence and Barbed Wire.

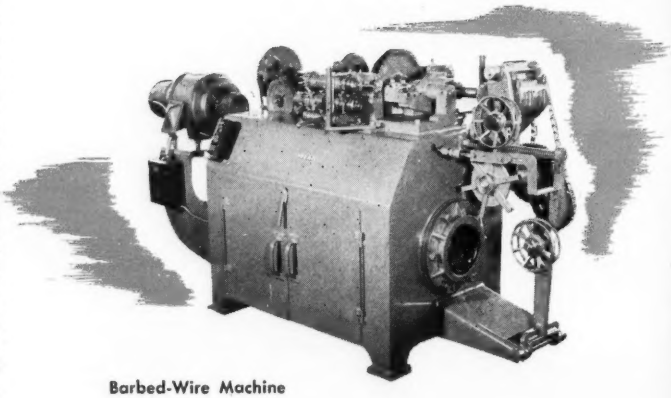
CHECK WEAN FIRST FOR WIRE MILL EQUIPMENT

STRIP MACHINERY

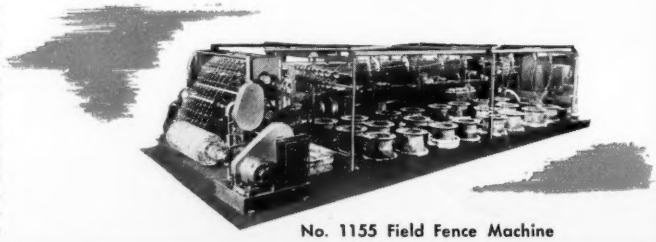
Slitting Installations. Cut to Length Installations. Bearing Metal Coating Installations. Two-Hi Rolling Mill Applications. Strip Grinding Installations. Levelers, Uncoilers, Pinch Rolls, Shears for Strip Processing lines.

WEAN EQUIPMENT CORPORATION

22800 LAKELAND BLVD. • CLEVELAND, OHIO



Barbed-Wire Machine



No. 1155 Field Fence Machine

Wean *Equipment Corporation*

WHAT DOES FIRTH STERLING OFFER YOU?

(ANSWER NUMBER 2)

ONE SOURCE FOR ALL TOOLING NEEDS

THE *RIGHT* STEEL OR CARBIDE . . . THE *EXACT* METALLURGICAL COMBINATION NEEDED TO DO YOUR JOB BEST . . . FROM A SINGLE MANUFACTURING SOURCE

The next time you have a difficult tooling problem we invite you to call in a Firth Sterling man.

He may be called a "tooling specialist" or a "sales engineer" . . . but anyhow he's just a fellow who understands the *cutting*, *shaping* and *forming* of metals like nobody's business. He *may* be a graduate engineer, or he may have learned the hard way on a milling machine, draw bench or press, but he *knows* the score.

He can give you an unbiased recommendation . . . because he has approximately 100 different grades of Firth Sterling high speed steels, and tool and die steels to choose from *and* a dozen grades of tungsten carbide in everything from die nibs to a virtually unlimited variety of standard and special carbide cutting tools and tips.

All this is backed by 64 years of leadership in the development and production of special purpose steels, and 24 years of pioneering in carbide and "powder metallurgy" applications.

It makes sense, that a company which engages in *all* phases of tooling metallurgy will serve your interests best.

Remember, Firth Sterling *is* a single, dependable source for complete shop tooling.

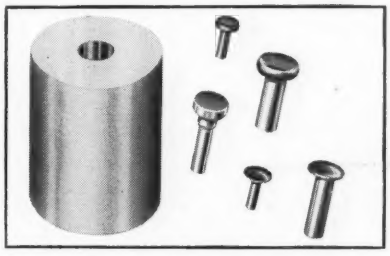
Firth Sterling Stands for Metallurgical Achievement—Past, Present, Future

I-2

DIE SPECIALISTS to the WIRE INDUSTRY

A COMPLETE LINE . . . CARBIDE AND STEEL

Firth Sterling offers wire manufacturers and fabricators the advantages of a *single* source of supply of materials for both tungsten carbide and tool steel drawing, shaping, forming and heading dies. This *complete* line, from famous Firthaloy, for maximum performance where carbide is a requirement, through almost one hundred grades of high speed and tool steels for cut-off knives, roll guides, die casings,

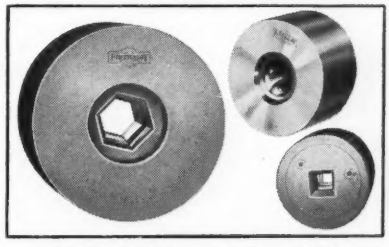


Carbide or steel heading dies—choose from the *complete* line which material best suits your needs.

forming rolls and similar applications, saves you time and money.

Standard items are available from warehouse stocks; others may be obtained from your local tool and diemaker.

Firth Sterling representatives are skilled in interpreting the needs of the wire industry and in suggesting the exactly right



Round, square, hex or specials—in carbide or steel as drawing requirements may indicate.

steel or carbide for specific applications. Because they know and sell both, you can depend on their unbiased recommendations to result in better, more economical tooling.

P-4

Firth Sterling

— INC. —

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

OFFICES* AND WAREHOUSES: BIRMINGHAM* CHICAGO CLEVELAND DAYTON* DETROIT HARTFORD HOUSTON* LOS ANGELES NEW YORK* PHILADELPHIA* PITTSBURGH* WASHINGTON*

PRODUCTS OF FIRTH STERLING METALLURGY

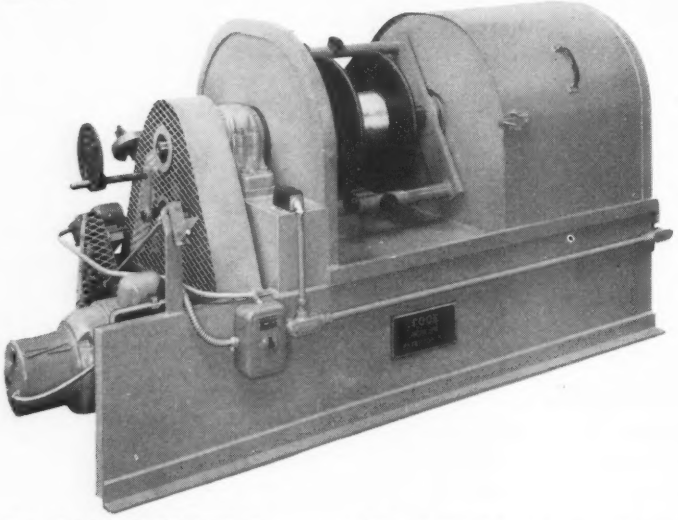
High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets

CONCENTRIC . . .
BUNCH STRANDING

DO YOU HAVE TROUBLE PRODUCING BUNCHED WIRE WITH THE SMOOTH CONCENTRIC QUALITIES OF STRANDED WIRE? IF SO THE COOK HIGH SPEED CONCENTRIC BUNCH STRANDER IS THE ANSWER TO YOUR PROBLEM.

HERE COMBINED IN A SINGLE MACHINE ARE THE ADVANTAGES OF BUNCHER AND STRANDER. THE COOK BUNCHER GIVES YOU SPEED AND CONCENTRICITY WITH NO SACRIFICE IN SPACE.

Shown below is the Cook Buncher Model B-H-21 which incorporates such worthwhile features as . . .



HIGH SPEED
(1400 twists per minute)

SINGLE TWIST FLYER

ELECTRONIC LAY CONTROL

LARGE TAKE-UP REEL
(350 pounds capacity)

This COOK BUNCHER has successfully formed bunched strands of 7, 10, 16, 19, 26, 41, and 65 wires with such concentricity as to enable its passage through an extruding die of only 1 mil clearance. In addition such constructions as 27/36 and 41/36 have been bunched at high speed with perfect concentricity on this versatile machine.

COOK MANUFACTURING COMPANY has a complete line of bunching equipment to accommodate the following reel sizes:

B-H-8	8″ x 6″	Capacity	40 lbs.
B-H-12	12″ x 8½″	"	100 "
B-H-21	21″ x 8½″	"	350 "
B-H-22	22″ x 11″	"	500 "
B-H-24	24″ x 11″	"	700 "

Write today for descriptive literature giving details of construction and performance of this high speed concentric bunching machine.

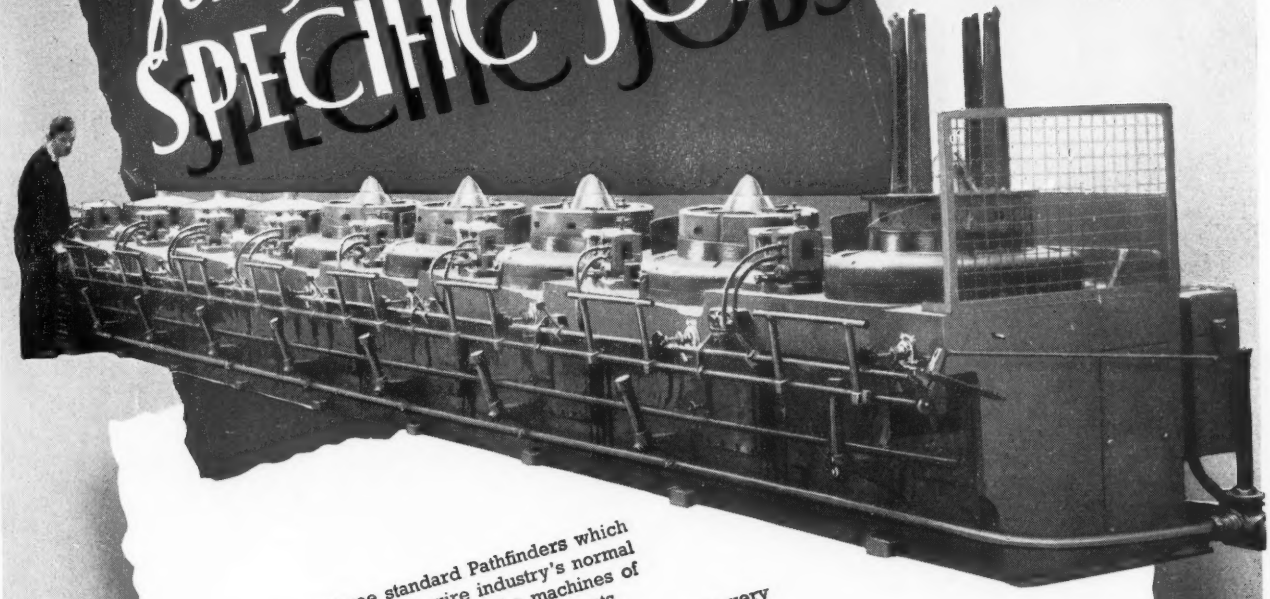
OTHER COOK EQUIPMENT

• Wire Drawing Machines • Bunchers • Twisters • Wire String-Up Machines • Enameling Take-Ups and Pay-Offs
• Enameling Machines • Cabling Machines • Spoolers • Tinning Take-Ups and Pay-Offs • Tinning Pots
• Wrapping Machines • Special Machinery

COOK MANUFACTURING COMPANY

50 EAST 25th STREET **PATERSON 2, N. J.**

Pathfinders for your SPECIFIC JOBS



In addition to the three standard Pathfinders which we offer to cover the steel wire industry's normal needs (brief details below) we make machines of this type to fulfil your SPECIFIC requirements.

An interesting example is shown here: it was made to draw very high grade rope wire from patented inlets of .375″ diameter through eight dies, finishing with a light draft to ensure good torsional qualities. The speed range on the last block is 400 to 1200 feet per minute.

THE STANDARD PATHFINDERS	Type 30/60	Type 22/40	Type 22/30
No. of Blocks	5	6	6
Block Diameter	30″	22″	22″
Max. Inlet (High Carbon) ...	.500″	.312″	.220″
Approx. finished size range	.250″ — .120″	.144″ — .080″	.120″ — .064″
Finishing speed range at full H.P.	450 — 1100 ft/min.	700 — 1400 ft/min.	800 — 1600 ft/min.

MADE IN BRITAIN

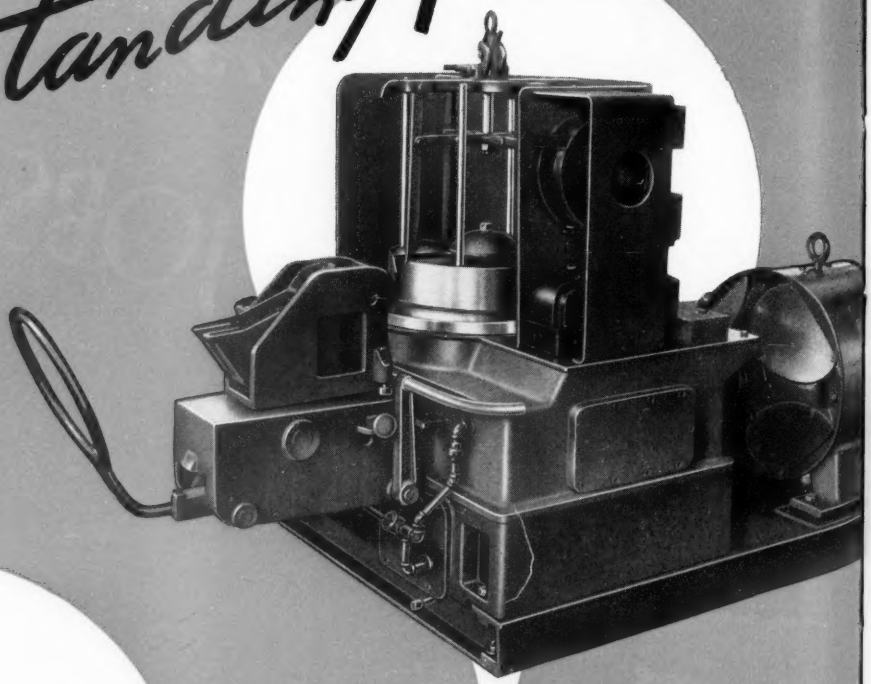
MARSHALL RICHARDS MACHINE CO. LTD.

CROOK • COUNTY DURHAM • ENGLAND

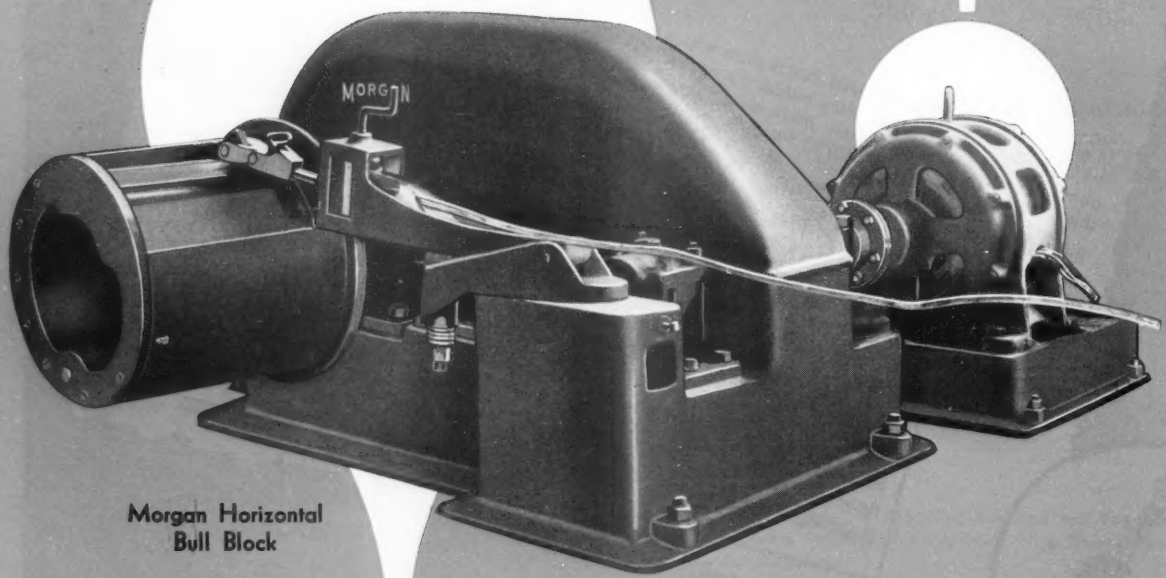
A Member of the Marshall Organization

M.R.71

These too, are giving *Outstanding Results*



Morgan
Wire Block



Morgan Horizontal
Bull Block

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

WM78

WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 28 NOVEMBER, 1953 No. 11

Designated as Official Publication By The Wire Association

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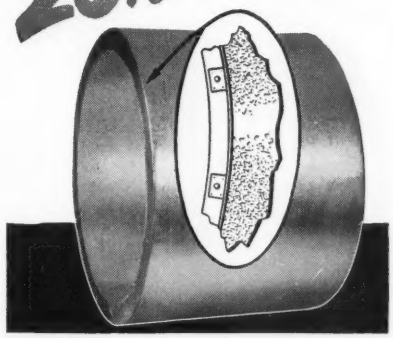
extra STRENGTH SERVICE and 20% LESS WEIGHT



NILES

"Reinforced Type"

FLANGED STEEL TRAVERSES

for wire and cable

. . . have extra strength where it is needed most—at bolt holes and base of the flange. This reinforcing makes possible the use of lighter gauge steel, saving up to 20% in weight while increasing overall strength.

Niles Flanged Steel Traverses have given as much as sixteen years' service without refinishing or major maintenance, according to actual experience records. In many cases their use has doubled the number of trips per reel before cut downs or scrapping of wooden heads.

They are manufactured in sizes up to 56" diameter and 48" traverse —in plain, painted or hot dip galvanized finishes—as light as 18-gauge steel. Width of flange and number of bolt and drain holes are furnished to your specifications. Available for prompt delivery. Write for prices.

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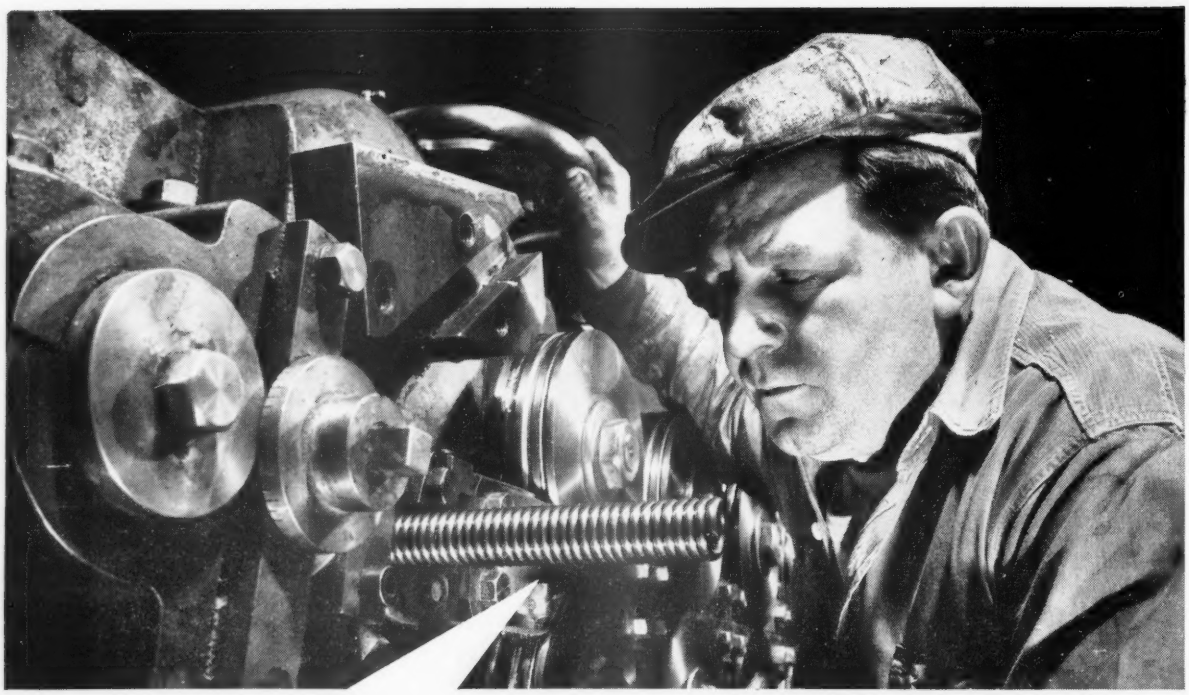
Manufactured Under License Arrangements With Western Electric Co., Inc.

REPUBLIC STEEL

PRESSED STEEL DIVISION
REPUBLIC STEEL CORPORATION
NILES, OHIO



Users tell the quality story

Diamond Wire Spring Company makes long runs, eliminates costly breaks with Pittsburgh Steel Oil Tempered Spring Wire

Skilled workmen, modern machines and Pittsburgh Oil Tempered Spring Wire form a combination that is hard to beat for producing quality springs with economy. *Users tell the quality story* better than we can. For example, skilled machine operators at the Diamond Wire Spring Company plant in Millvale, Pa., sum it up this way. They like Pittsburgh Wire because it enables them to make long runs without costly stops caused by broken wire. Matthew Kline, a veteran with twenty years experience making steel springs, said:

"Pittsburgh Wire is good stuff. I can tell by the way it handles whether it's Pittsburgh or some other make. I like it because it keeps my machine going full tilt for long runs. The management likes it too—helps keep costs down."

For this reason, Diamond Wire Spring Company uses tons of Pittsburgh Steel's Oil Tempered Spring Wire to produce thousands on thousands of springs for farm implement machinery and journal box lids for railroads.

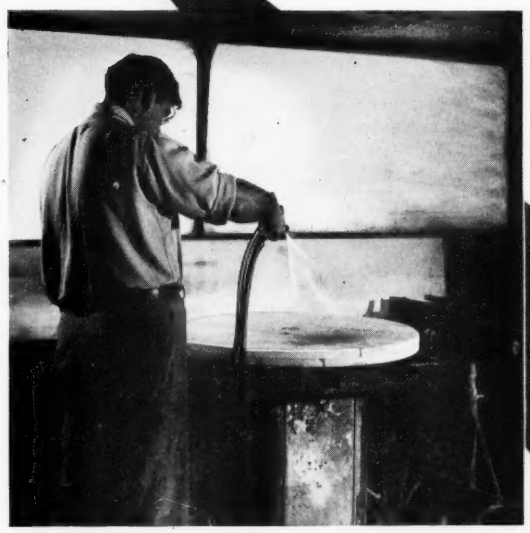
If you manufacture springs and other products from wire, we would like to show you how others eliminate production difficulties, maintain high quality of their products with Pittsburgh Oil Tempered Spring Wire. Just give it a trial.

For information about our high quality wire and wire products write Department WW, Pittsburgh Steel Company, Grant Building, Pittsburgh 30, Pa.

Pittsburgh Wire

a product of **Pittsburgh Steel Company**

GET YOUR REELS AS ORDERED



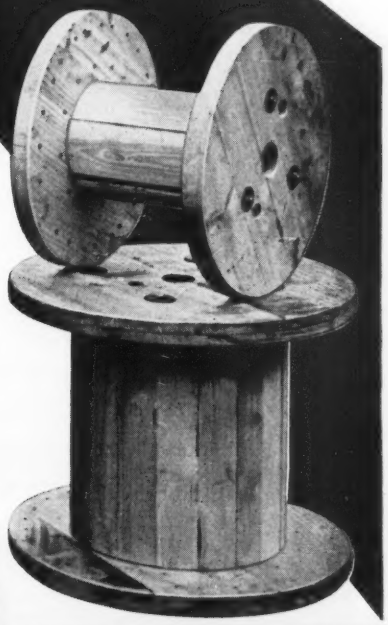
Above: reels being painted

BRIDGE WOOD REELS SHIPPING AND SHOP—ALL TYPES

12" to 96" in diameter, knocked down or assembled; returnable or non-returnable; wood heads for steel drums. All precision-made to your specifications, strong for severe handling, low in cost.

EVERY MILL HAS ITS OWN REEL SPECIFICATIONS

Bridge is equipped to meet your specifications accurately and without delays. Our straight-line production methods and efficient automatic equipment turns out reels accurately, fast and at low cost. Every reel is a quality product, designed for the toughest conditions of service. Bridge reels come to you "as ordered" both as to specifications and delivery dates.



BRIDGE
MANUFACTURING CO.
HAZARDVILLE, CONN.

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Riverview 9-8308

What kind of wire do YOU want?

You want manufacturers wire to be uniform in grade, strength and analysis . . . free from harmful imperfections . . . meeting specifications exactly. And that's the kind of wire we've been turning out for over a hundred years. Today we can offer you over 400 different types of American Manufacturers Wire, of every size, shape, finish, and metallurgical characteristic . . . and of *consistently* high quality. All this helps to simplify your fabrication job.

Here's another way we can help you. Our staff of trained metallurgists and engineers know wire-application problems inside-out. They've assisted thousands of manufacturers in finding the most suitable wire for a specific job . . . in cutting costs and improving products. And these men are at your service, ready to go to work on your problems too.

If you want a type of wire that we don't regularly produce, you can depend on our modern plant facilities to draw a special wire that will fit your needs exactly. Call our nearest sales office for further information.

If you make it of wire... make it of the best!

U·S·S AMERICAN MANUFACTURERS WIRE

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High-quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire.*

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

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UNITED STATES STEEL

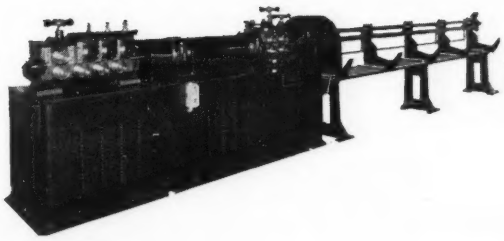
THE BIG NEWS IN WIRE STRAIGHTENING IS THE NEW

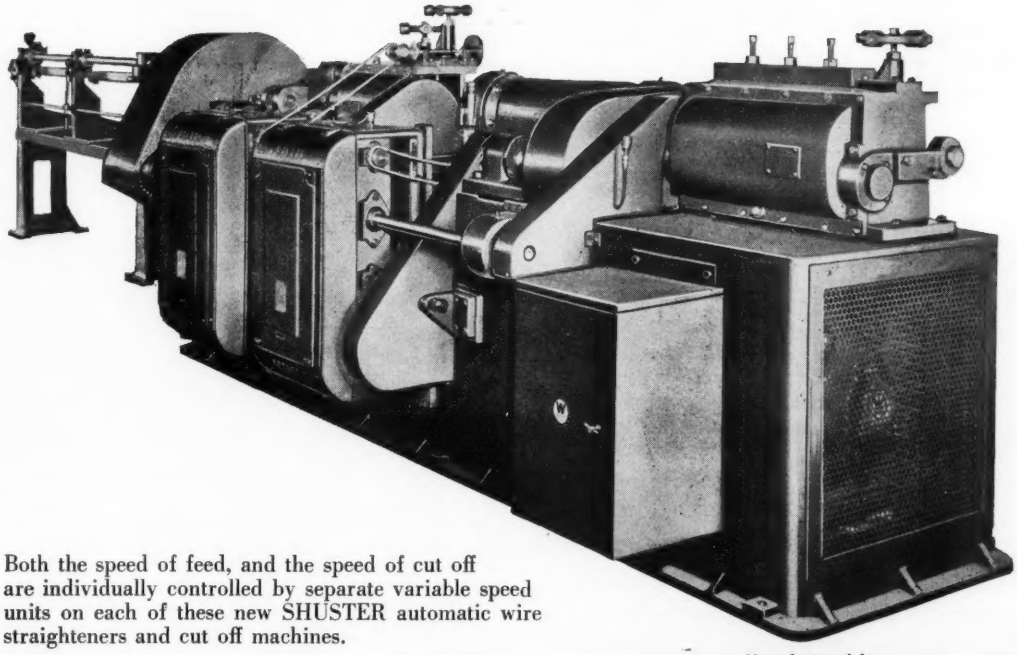
SHUSTER *Since 1866*

Dual Control

3 AV & 4 AV

with **INFINITE SPEEDS**





Both the speed of feed, and the speed of cut off are individually controlled by separate variable speed units on each of these new SHUSTER automatic wire straighteners and cut off machines.

No. 3AV handles wire 1/2″ dia. max.; 4AV will take 11/16″ max.

Of all SHUSTER machines built since 1866, we feel these are the best yet. Write for Bulletin 37V and get the complete story.

Manufactured by

METTLER MACHINE TOOL, INC.

132 W. Lawrence St., New Haven, Conn.

Representatives in all principal cities and in foreign countries.

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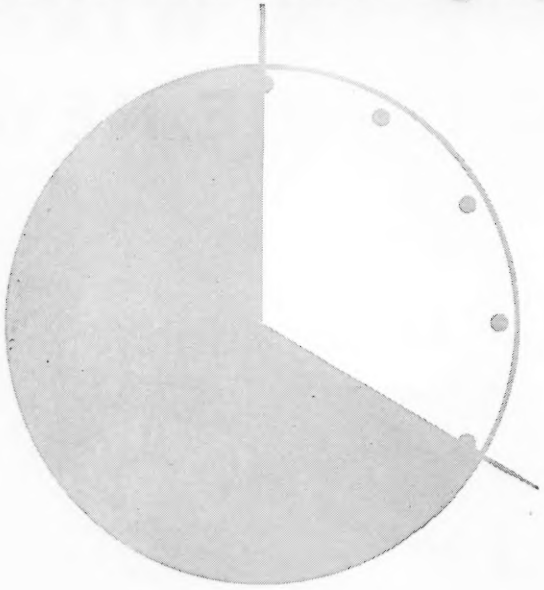
SHUSTER *Automatic* *Since 1866*

WIRE STRAIGHTENING AND CUTTING MACHINES

You can thoroughly descale most metals



in 20 minutes or less!

RETREATMENTS ARE RARELY NEEDED WITH THE

DU PONT SODIUM HYDRIDE DESCALING PROCESS

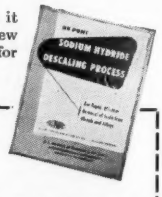
In 10 to 20 minutes fabricated articles, sheets, wire, rods, bars and forgings are completely descaled with the Du Pont Sodium Hydride Descaling Process. Even heavily scaled forgings (½" scale thickness) take less than an hour. And *in only 15 seconds* you can get cold reduced-annealed strip clean and bright!

Fast as it is, sodium hydride descaling is amazingly thorough—retreatments *are rarely needed* to clean a wide range of metals completely. All metals not affected by fused caustic at 700°F. can be treated, either separately or in combination. There's never any danger of etching or pitting . . . never a costly reject due to loss of gauge. Base metal is always protected, since *bath action stops the moment scale has been reduced.*

Get all the facts from Du Pont—the pioneer of Sodium Hydride Descaling. You'll find the Process remarkably economical to install and operate. Just get in touch with our nearest district office or send in the coupon below.

DISTRICT AND SALES OFFICES: Baltimore • Boston • Charlotte • Chicago Cincinnati • Cleveland • Detroit • Kansas City* • Los Angeles • New York Philadelphia • Pittsburgh • San Francisco. *Barada & Page, Inc.

More detailed information about the process—how it works, what it can do for you—can be found in our new book. Call our nearest office or use the coupon below for your copy.



DU PONT
Sodium hydride process for positive descaling

DU PONT
REG. U.S. PAT. OFF.

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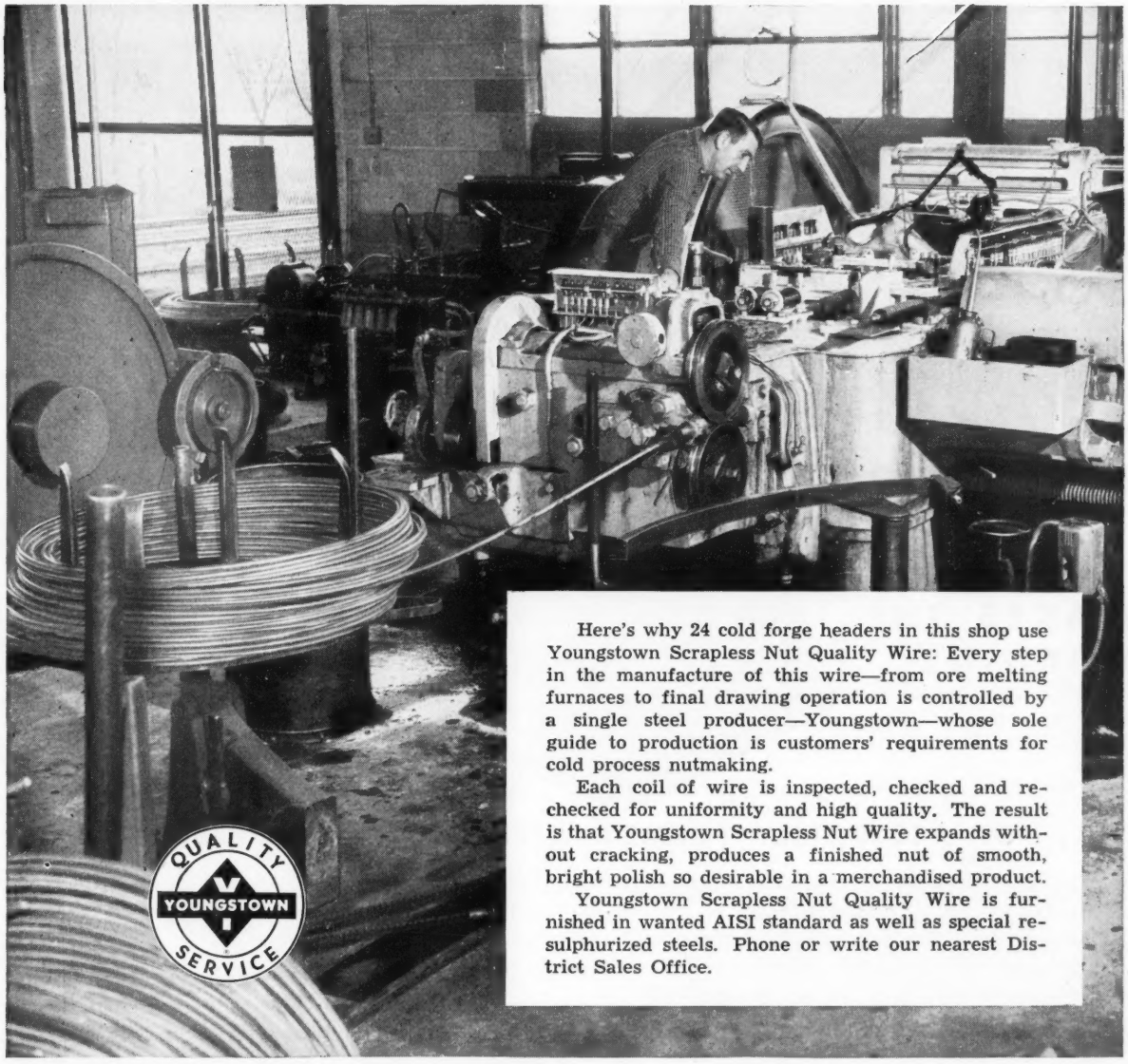
E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department WW-103
Wilmington 98, Delaware

☐ Please send me your booklet on Sodium Hydride Descaling.
☐ Please have one of your technical men call. I am interested in descaling _____.

Name _____ *Position* _____
Firm _____
Address _____
City _____ *State* _____

NUTS DON'T CRACK WHEN FORGED FROM YOUNGSTOWN SCRAPLESS NUT WIRE



Here's why 24 cold forge headers in this shop use Youngstown Scrapless Nut Quality Wire: Every step in the manufacture of this wire—from ore melting furnaces to final drawing operation is controlled by a single steel producer—Youngstown—whose sole guide to production is customers' requirements for cold process nutmaking.

Each coil of wire is inspected, checked and rechecked for uniformity and high quality. The result is that Youngstown Scrapless Nut Wire expands without cracking, produces a finished nut of smooth, bright polish so desirable in a merchandised product.

Youngstown Scrapless Nut Quality Wire is furnished in wanted AISI standard as well as special resulphurized steels. Phone or write our nearest District Sales Office.

Youngstown SCRAPLESS NUT QUALITY WIRE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

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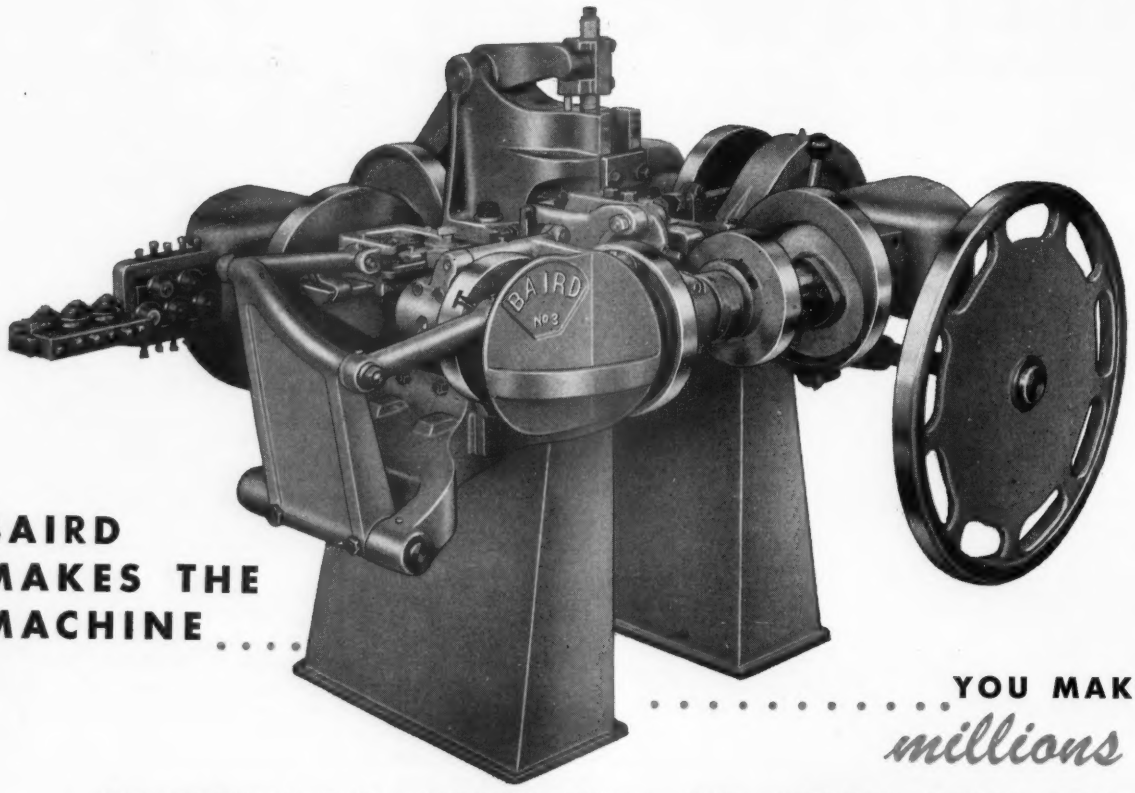
HIGH PRODUCTION TOOLING



BAIRD MAKES THE MACHINE . . . . . YOU MAKE *millions*

. . . OF ACCURATELY FORMED WIRE AND RIBBON METAL PARTS

The Baird automatic Four-Slide Machine produces an extremely wide variety of articles made of any commercial wire . . . round, half-round, square, or flat . . . at highest speeds. It takes coiled wire from a reel, straightens, feeds, and cuts off the required length . . . then forms and ejects the part produced. Eight sizes handle shorter wire lengths; three sizes take longer lengths to 32½".

By means of special attachments, the versatility of the machine is further extended to include the making of round wire and ribbon metal rings, secondary cut-offs, lettering, and other operations.

The detailed and complete story, with specifications, is told in our new Four-Slide Bulletin. If you require hundreds of thousands or millions of wire units to ½" dia., or flat ribbon metal products to 1½" wide . . . this is your profit-making machine. Send for bulletin.

3BA53

the BAIRD MACHINE COMPANY
STRATFORD • CONNECTICUT

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

STEEL TRAVERSES

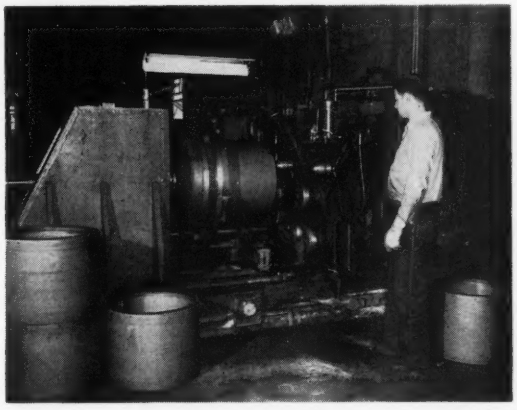
FLANGED STEEL DRUMS FOR REELS
for
WIRE ✦ CABLE ✦ WIRE ROPE

Plain finish . . .

Painted finish, or . . .

Galvanized finish (Hot dipped)

- **For use with nailed, plywood, metal bound and cast flanges. Made from a single sheet of metal—rolled—welded—flanged, with bolt holes punched to your specifications.**



SAVES COST in assembly of reel by eliminating handling of larger number of small parts.

SAVES COST by making repairs easy.

SAVES COST by increasing reel life.

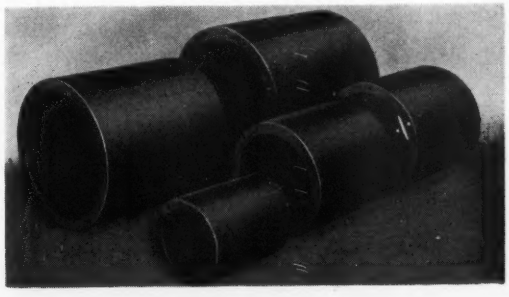
SAVES COST by reducing damage to wire and cable.

LATEST SEMI-AUTOMATIC FLANGING EQUIPMENT AND NEW GALVANIZING PROCEDURE MAKE POSSIBLE LOWEST UNIT COST.

Furnished in steel and aluminum—with flanged or plain ends.

Reinforced construction for heavy duty operations.

- **HUBBARD MAKES A COMPLETE LINE OF ALL STYLES OF FLANGES FOR USE WITH STEEL TRAVERSES.**



HUBBARD SPOOL COMPANY

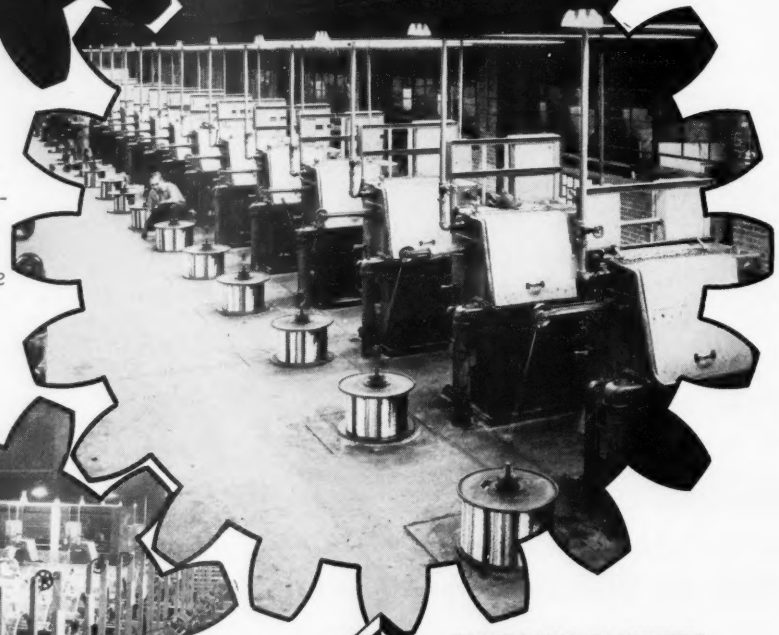
GARRETT (Tel.: Garrett 840) INDIANA

"THE BIGGEST NAME IN SPOOLS AND REELS"

it.. PAYS to buy the... BEST!

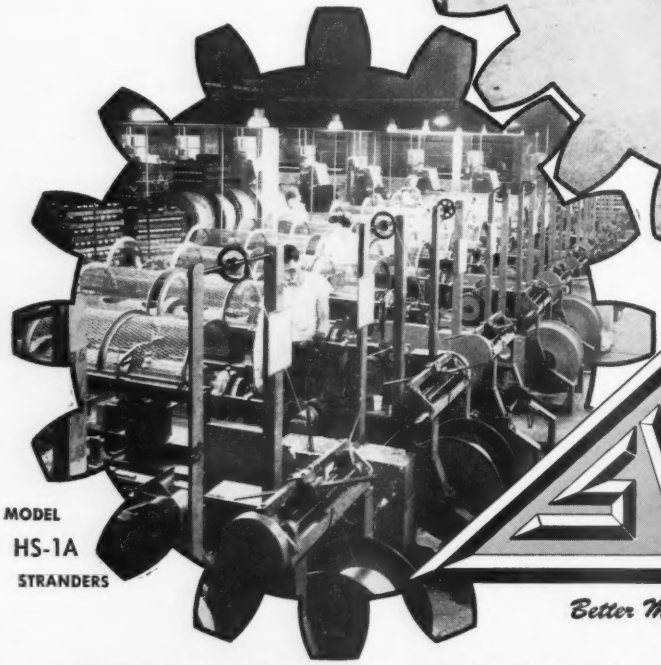
INSULATORS
CONTINUOUS ANNEALERS
WIRE DRAWING MACHINERY
STRANDING MACHINERY
TAKE-UPS
SPECIAL MACHINERY

MODEL A-16 FINE WIRE DRAWING MACHINES



WIRE MILLS everywhere have found SYNCRO machines essential to profitable operation

DESIGN and QUALITY features make them OUTSTANDING and your BEST investment



MODEL HS-1A STRANDERS

ILLUSTRATIONS BY COURTESY OF SPENCER WIRE CORP. UNION, N. J.

SYNCRO®

Better Machinery for the Wire Industry

SYNCRO MACHINE COMPANY

PERTH AMBOY • NEW JERSEY • U. S. A.

affiliated Company: WINGET-SYNCRO Lt'd. Rochester • Kent • ENGLAND

ELGIN DIAMOND

meets rigid quality standards

at Allegheny Ludlum Steel Corporation, Pittsburgh

When wire is pulled through carbide dies, tremendous heat and pressure are generated. That is why the working surfaces of wire drawing dies must be polished to a near perfect finish. That is why Allegheny Ludlum uses Elgin Diamond.

Elgin Diamond assures the finest possible finish—and in less time—because all Elgin Diamond is precision graded and permanently suspended in a color-identified compound right in the Elgin laboratories. There are no oversize particles to scratch, no "fines" to decrease cutting efficiency.

Hundreds of die finishing applications prove Elgin Diamond reduces costs and produces a better finish every time . . . in less time! Now is the time to try Elgin Diamond and prove it to yourself!

Ask for a free demonstration!

ABRASIVES DIVISION

ELGIN NATIONAL WATCH COMPANY

Dept. G

ELGIN, ILLINOIS

Here's the World's BEST Insurance for Insulated Wire Manufacturers!

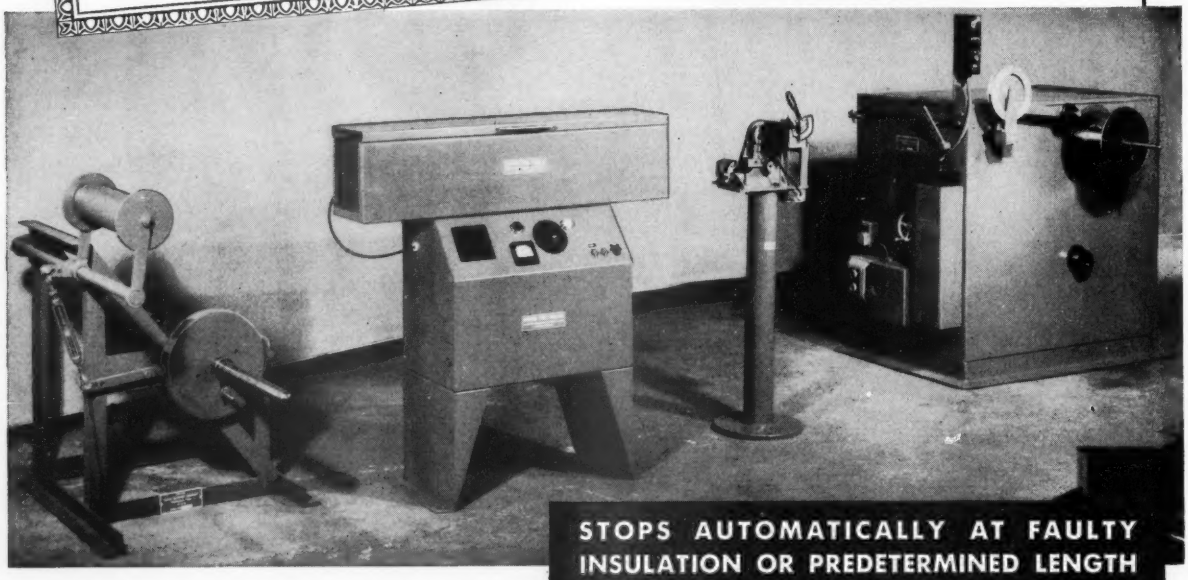
DAVIS

Automatic

SPARK-TESTING

Equipment

It insures against faulty wire insulation that causes customer problems.



STOPS AUTOMATICALLY AT FAULTY INSULATION OR PREDETERMINED LENGTH

DAVIS PAY-OFF (extreme left) automatically controls tension and braking, stops instantly when reeler or respooler shaft stops! Simply designed for left or right hand use . . . ruggedly built for lasting service. Shaft sizes: 1¼" or 1½"; for reels up to 30" diameter, 16" width.

DAVIS #4 SPARK-TESTER (left center) automatically stops at and locates insulation defects. It has a 36" stainless steel, bead chain electrode with maximum wire size of ¾" and wire speeds of 1200 fpm. Its volt-testing range is 1,000 to 15,000; up to 30,000 can also be supplied. Operates on 110 volts; other voltages obtainable. *Options:* footage can be increased by lengthening electrodes; electrodes available to accommodate up to 4" cable.

DAVIS WIRE MEASURING MACHINE (right center) with predetermined counter accurately measures wire footage. Counter is simple to set. At desired footage, its built-in switch shuts off power to reeler and respooler. Pedestal-mounted.

DAVIS REELER, RESPOOLER AND COILER is a versatile, variable speed unit with electrically or electronically controlled motor drive. Controls start machine with low torque to prevent wire stretching and/or breakage. Interchangeable shaft feature permits changing shafts in seconds. For reel diameters 6" to 30"; shaft diameters ⅝" to 1½". Constant footage device optional. Has electrical disk brake and safety cap for idler shaft. Easily accessible control synchronizes traverse variable speeds with spooling shaft speeds. Traverse width up to 16". Winding speed range: 10 to 1. Maximum wire speed: 1200 fpm. Unit adaptable for use with any type collapsible coiling head up to 30" diameter.

Accurate, dependable, easy-to-operate Davis products are available in complete assemblies as shown, or individually. Write for catalog bulletins and quotations on your requirements.

Davis ELECTRIC CO.

WALLINGFORD, CONN., U.S.A.

HARNESS TESTERS ★ PAY-OFFS ★ TRAVERSES

DAVIS WIRE & CABLE EQUIPMENT

SPARK TESTERS ★ SPOOLERS ★ TAKE-UPS ★ CAPSTANS

Correspondents throughout the world

Foreign Sales Representatives: OMNI PRODUCTS CORP. 460—4th Avenue, New York 16, New York

More For Your Money

HOLDEN SALT BATHS AND INDUSTRIAL POT FURNACES

Holden Type 701 Electrode Furnaces

. . . provide these Important Advantages

1. **Electrodes are completely separated** from the working area of the furnace. The brick structure is so designed that it is impossible for work to come into contact with electrodes, either in the basket or work holding fixture.

2. **Electrodes are easily replaceable.** The overhanging ledge permits repair or replacement without disturbing the refractory.

3. **No water cooling of the furnace wall** is required, so there is no power loss with this design.

4. **Split design electrode assembly,** an exclusive development of the Holden Company, provides 80% more area over which to carry secondary current.

5. **A 15 to 20% improved efficiency** is possible when this type electrode assembly plus the flexible braid for transmission of secondary power is used on competitive furnaces.

6. **A single bolt connection for water cooling** the electrode assemblies prevents oxidation of the copper to copper connection. Similarly with such water cooling of these terminals there is no possibility of inducing the heat from the furnace back to the transformer.

• SAVE ONE THIRD On Your Present Furnace

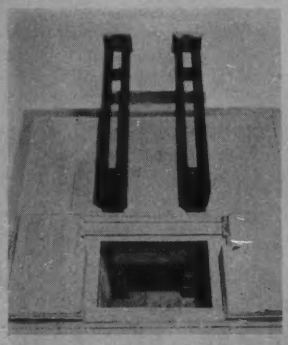
Any competitive furnace using the older type construction can be converted to this design with an electrical saving of approximately 33 1/3%.

INVESTIGATE THE HOLDEN LEASE PLAN

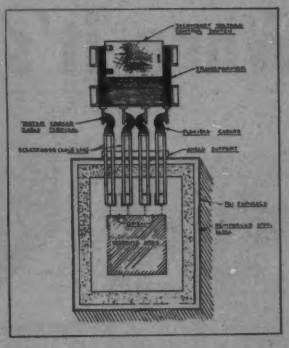
1. It will save you **one-third** over direct purchase and depreciation.
2. No capital investment required.

For full information, write or phone:

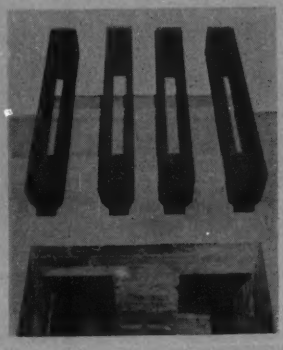
J. B. Carey, Detroit—Texas 4-8127
M. R. Boyle, New Haven—State 7-5885



HOLDEN TYPE 701-2
Submerged Electrode Unit with removable electrodes.



Drawing of HOLDEN TYPE 701-4
Submerged Electrode Furnace.



HOLDEN TYPE 701-4
Submerged Electrode Unit with replaceable electrodes.

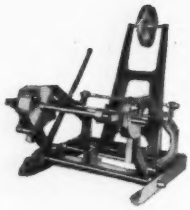
THE A. F. HOLDEN COMPANY

THREE F.O.B. POINTS — LOS ANGELES, DETROIT and NEW HAVEN

P.O. Box 1898
New Haven 8, Conn.

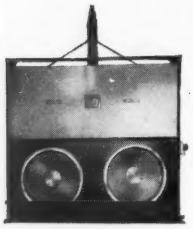
3311 E. Slauson Ave.
Los Angeles 58, Calif.

11300 Schaefer Hwy.
Detroit 27, Mich.



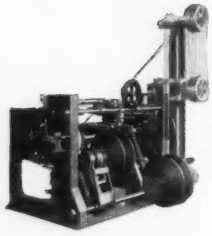
PAY-OFF

Equipped to take reels up to 36" in diameter. Cam-and-lever lift from floor. Mechanism is automatically self-braking, with brake activated by any slackening of wire speed. Rugged construction.



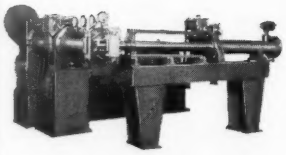
DAVIS-STANDARD CAPSTAN

Drag and pulling type. Supplies for almost all wire plant needs. Aluminum or cast iron drums, grooved or flat, in any radius desired. Gear reducers standard, four-speed transmission optional.



NEW-TYPE TAKE-UP

Great new efficiency. Quiet, vibrationless. No gears or clutches. Operates positively at high speeds. Reel drive by multiple V-belts. Automatic brake. Totally new traverse mechanism. Speed range choice for constant tension control. Built in two sizes: for reels 12" to 24" and 24" to 36".

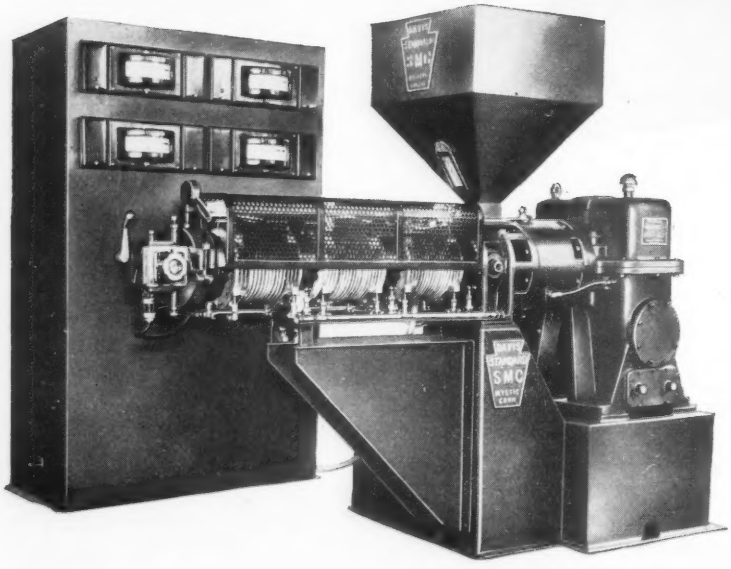


CONTINUOUS VULCANIZER

Heavy duty model assures uniform curing at high production rate. Made in 3¼", 4½", and 6" bore sizes for hot or cold fed compounds.

When is an Extruder an *Excluder*?

When it's a DAVIS-STANDARD



When you purchase superior extrusion equipment, you *exclude* troubles. That's why more and more companies are installing Davis-Standard extrusion equipment. They know that it *pays* to buy extruding machines from the world's largest manufacturer of custom-made extrusion equipment for rubber and thermoplastics.

Davis-Standard extruders assure high-velocity extrusion, maximum operating efficiency, and are available with accessory units which mean satisfying, profitable production.

DAVIS-STANDARD SALES CORPORATION

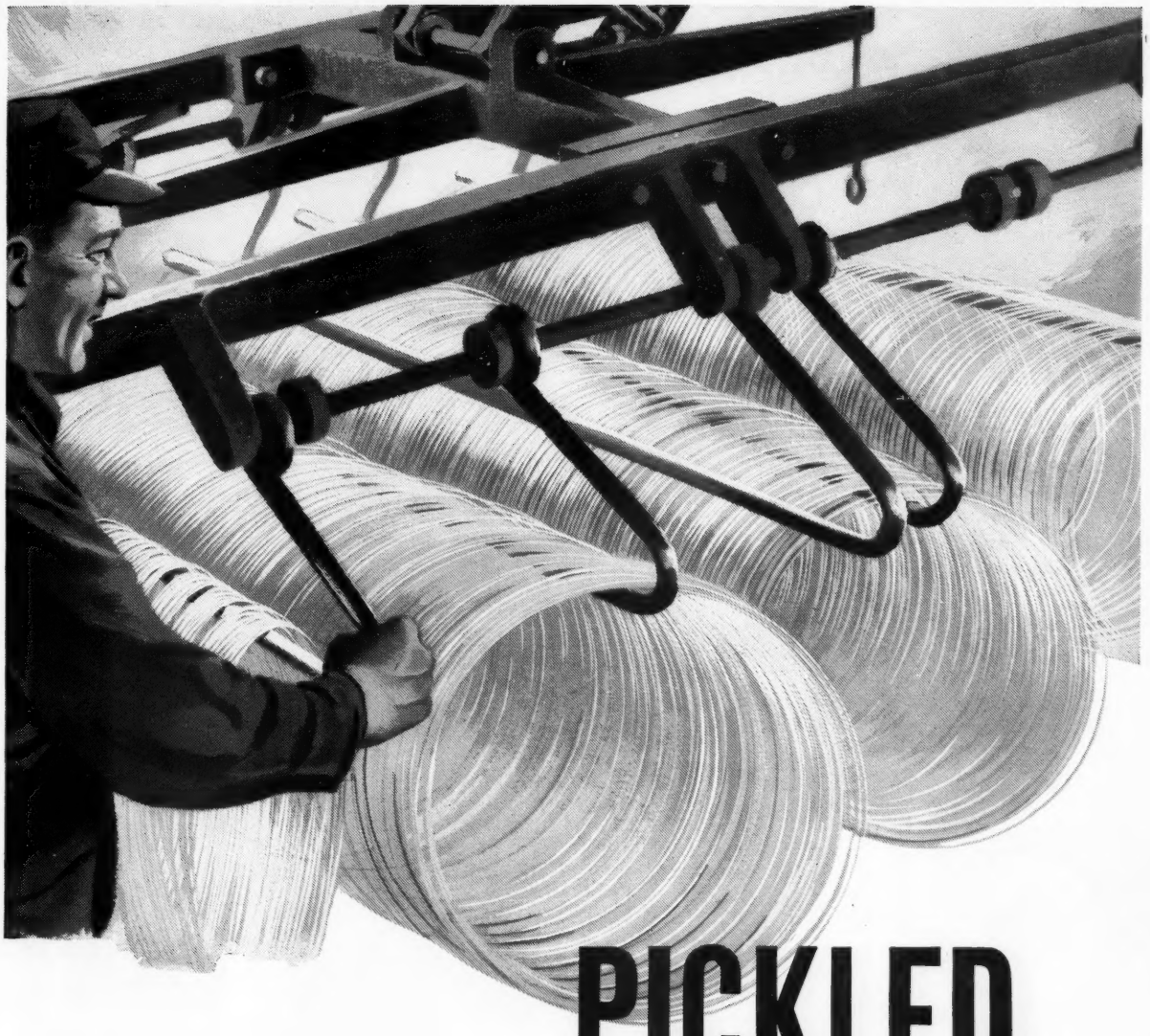
14 WATER STREET MYSTIC, CONNECTICUT

SOLE SELLING AGENTS FOR

THE STANDARD MACHINERY COMPANY

EXTRUDING MACHINES AND MOLDING PRESSES

World's Largest Manufacturers of Custom-Built Extruding Machines



PICKLED

to bring you CHASE® wire with a clean, bright finish

Be sure you're getting clean, even tempered brass or copper alloy wire, free from physical defects. Ask for Chase wire by name.

We check constantly on the dimensions, color, surface condition and temper of Chase wire to make sure the wire you get is entirely uniform. Only a flash pickle is required to make Chase wire clean and oxide-free because carefully controlled annealing assures a high lustre, excellent surface texture and uniform color.

Cut your production costs with Chase wire. Write for free booklet giving shapes, sizes, alloys and tempers available.

Chase BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper

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Baltimore	Denver †	Milwaukee	Pittsburgh	Waterbury
Boston	Detroit	Minneapolis	Providence	
Chicago	Houston	Newark	Rochester †	(† sales
Cincinnati	Indianapolis	New Orleans	St. Louis	office only)

HERBORN

NON-SLIP CONTINUOUS WIRE DRAWING MACHINE, MODEL G. M. I., straight pull, without upper by-pass, suitable for drawing high quality steel wires from .354" maximum.

We construct wire drawing machines performing all kinds of drawing operations. We are always ready to advise you on all further details.

MASCHINENFABRIK HERBORN BERKENHOFF & DREBES A. G.
Our speciality: Machines for wire industry

HERBORN
(Dillkreis) Germany

Representative of our products in the U.S.: Kurt Orban Company, Inc.
205, East 42nd Street, New York 17, N.Y. — Phone: Murray Hill 4-7700

SERVICE
ON
WIRE DRAWING COMPOUNDS

On a subject as complex as wire drawing lubricants and their applications, "SERVICE" can mean much or little, depending on who attempts to render it.

STANDARD'S field men are all wire drawing *specialists,* equipped with that experience and knowledge of the practical side of wire drawing that enables men to render the competent service so sorely needed.

STANDARD, for instance, has some 75 compound formulas, each designed for a special application. Even for bright wire, STANDARD has 5 different compounds. Only competent experts who know wire and lubricant properties can advise where and how to use them for best results.

In buying from STANDARD you can ask for and get that plus value called "SERVICE." This service will help you select the *right* compound for the wire to be drawn and the conditions under which you operate.

STANDARD'S specialists are ready and able to serve you.

You Are Invited to Come to "Service" Headquarters on Your Wire Drawing Lubricant Problems

Call or Write Headquarters or Any Standard Service Center:

Bruce W. Siemon
2400 Morrow Pl.
Pittsburgh 34, Pa.

Earl A. Bowers
5536 Lisette
St. Louis, Mo.

John A. Moritz, Jr.
4600 W. Ferdinand St.
Chicago 44, Ill.

Charles P. Orr
Caledonia Park
Fayetteville, Pa.

Standard Industrial
Compounds Co.
Millbury, Mass.
Arthur J. O'Mara

STANDARD INDUSTRIAL COMPOUNDS COMPANY has pioneered most of the outstanding contributions to better wire drawing through better lubricants. Consult with STANDARD for the solution of your difficult problems. We welcome your inquiries.

wire drawing lubricants **Standard** INDUSTRIAL COMPOUNDS CO., INC.
4600 WEST FERDINAND STREET
CHICAGO 44, ILLINOIS

Fastest Process Annealing FOR COILED STEEL WIRE

- ✓ Annealing cycles accomplished in minutes rather than in hours
- ✓ 50% lower equipment cost
- ✓ less floor space
- ✓ no scale, decarburization, or other atmosphere effects

On-the-job production figures prove that no other method compares with an Ajax Electric Salt Bath Furnace in speed, uniformity, cost saving, and general all-around efficiency in process annealing all types of steel wire as well as aluminum, copper alloys, and silver alloys.

Heating cycles are far faster. Absolute uniformity is assured. Thanks to the exclusive Ajax electrodynamic stirring action, the temperature does not vary more than ±5°F. *in any part of the bath.*

The Ajax Salt Bath eliminates all atmosphere with its accompanying problems of oxidation, pitting, and decarburization. Preservation of metal surface is assured. Equipment cost is much lower —and the Ajax handles more work for a given amount of floor space than any other method. Ajax Reprints 62 and 63 gladly sent on request.

LOW- AND HIGH-CARBON STEELS

This typical Ajax installation process anneals 1200 lb. 18-gauge wire an hour in only 58 feet of floor space.

STAINLESS STEEL

Annealing fine gauge nickel-chromium wire at 1950°F. Clean wire surface eliminates conventional pickling operations.

- **TOPS for WIRE PATENTING, too!**
- **IDEAL FOR DESCALING** hot-rolled stainless and alloy steel wire and other shapes employing either the Dupont sodium hydride or the Hooker Electrochemical Virgo bath.

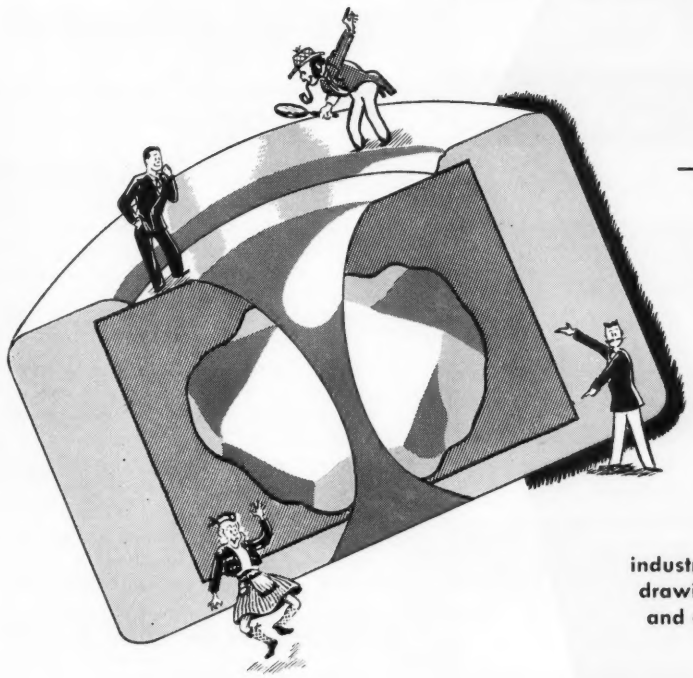
Associate companies: Ajax Electric Furnace Corp. • Ajax Engineering Corp. • Ajax Electrothermic Corp.

AJAX electric SALT BATH furnaces

OVER 4,000 INSTALLATIONS . . . more than all other salt baths combined

AJAX ELECTRIC CO., Inc., 928 Frankford Ave., Philadelphia 23, Pa.

What To Look For In
DIAMOND DRAWING DIES



—your assurance of diamond dies of *utmost roundness, accuracy and long life* — made with highest quality industrial diamonds, and specially selected by diamond experts for hardness, lasting quality and specific wire drawing needs. Roux selections are made from—

the hardest of all industrial stones that last longer in the drawing of steel, steel alloys, tungsten and other tough metals.

second only to Brazilian in hardness, but extremely satisfactory for drawing copper, brass, aluminum and other highly ductile metals.

All three of paramount importance.

***Certainly* size is important: However, equal consideration must be given to the shape and hardness of the stone; factors having a very important bearing on both the cost and the quality of the finished Diamond Die.**

LOWER COSTS *"IN THE LONG RUN"*

It's false economy to try and save on initial die costs. True, quality diamond dies cost more in the beginning but their long life of usefulness will actually save you money. *Roux Diamond Wire Drawing Dies are a sound investment*

ROUX DIAMOND WIRE DRAWING DIES

If your present Diamond Dies are not giving maximum service, Roux can solve your problem; and there is no obligation for inquiring.

SERVICE FOR BEST RESULTS

Our job is to meet your Diamond Die needs as well and as economically as is humanly possible.

Roux WIRE DIE WORKS, INC.

2485

STEELSKIN Lubricants
—and how to use them...

This is the fourth in a series of advertisements cataloging the complete line of Steelskin Lubricants. Keep this for handy reference.

(No. 4 of a Series)

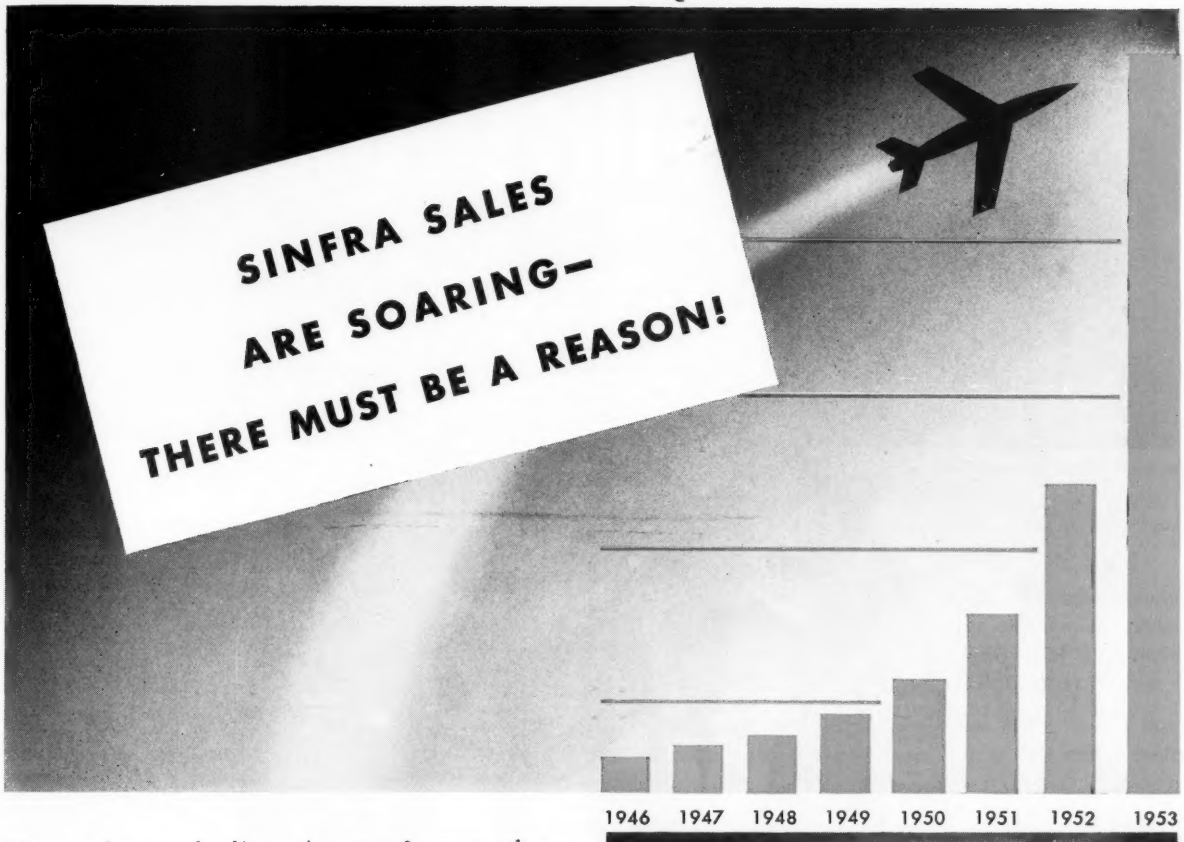
PRODUCT	SHIPPING INFORMATION	USES
#40 POWDER	325# Net FIBER DRUM	For drawing rod or wire coated with lime or STEELSKIN W-Coating Compound. End uses include galvanizing, tire bead, poultry netting, screen cloth, springs, nails, rope, etc.
CXH-N POWDER	350# Net FIBER DRUM	A special modification of STEELSKIN CXH which is used to produce a non-tacky, white spring-wire finish.
REDSKIN SHIELD	350# Net FIBER DRUM	This compound dissolved in hot water is used to provide a protective coating for copper-coated wire. It helps to protect against rusting, to maintain a bright finish, and to provide a lubricant carrier for subsequent drawing operations.
LSL GREASE	480# Net STEEL DRUM	A petroleum-base grease for use in producing bright grease-drawn copper-coated wire. It also serves for one- and two-hole bright steel wire from lightly limed stock (for plating, for example).
#1231 PASTE COMPOUND	480# Net STEEL DRUM	A **non-foaming** wet-drawing lubricant for intermediate and fine sizes. It serves equally well for ferrous and non-ferrous wire. It is also quite satisfactory for phosphate- and metallic-coated finishes.
GF-50 POWDER	300# Net FIBER DRUM	For dry-drawing welded fabric and welding wire (from two to four holes) using stock which has been lightly limed.
10-M POWDER	350# Net FIBER DRUM	For producing nail wire with a simulated sull-coat finish with excellent nail-cutting properties.
CE POWDER	325# Net FIBER DRUM	A NEW approach to cold-heading lubrication. Outstanding lubrication properties, completely homogeneous, not fluffy, very inexpensive. Comes ready to use; no mixing necessary.

"STEELSKIN" *First in Lubrication—First in Service*

Steelskin LUBRICANTS

R. H. MILLER
Company, Inc., Homer 1, N. Y.

SOAPS AND COMPOUNDS FOR WIRE DRAWING, TUBE DRAWING, DEEP DRAWING AND STAMPING.

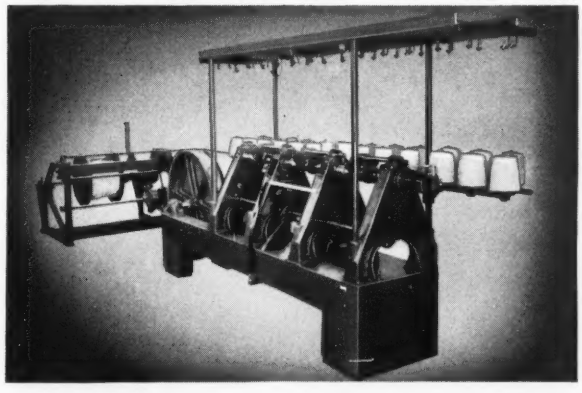


More and more, leading wire manufacturers the world over are proving the advantages of the *Fidelity Sinfra Knitter.**

With each new installation the *Sinfra* establishes —time after time—its ability to cover wire faster and more economically than any other method.

Today, the list of *Sinfra* users includes the world's foremost manufacturers of Wire and Cable.

Why not prove for yourself the outstanding advantages of this amazing machine? Write today for Catalog W or visit the new show rooms at our plant.



*Approved by Underwriters' Laboratories, Inc., American Standards Association, Association of American Railroads, Canadian Standards Association, and Federal Specification J-C-145.

Designers and Builders of Intricate, Automatic Precision Machines

SINCE 1911

FIDELITY MACHINE COMPANY, INC.

3908 - 18 FRANKFORD AVENUE, PHILADELPHIA 24, PA.

Export Dept.:
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For the FINEST Dies...

Specify

DIES... TOOLS... WEAR PARTS... BLANKS...

TELEPHONE FACTORY and BRANCHES

IN CANADA— (TOOLS) CARBIDE TOOL COMPANY, LTD., W. Toronto 3, Ont. (DIES) VASCARB TOOL & DIE CO., Hamilton, Ont.

The Wire Outlook

With manufacturers' and retail inventories piling up and sales falling off, there will probably be a slowing down in auto, appliance, farm equipment, construction and metal working machinery production in the last quarter.

Two good barometers of business are steel and automobile production. What the impact of new car models will be remains to be seen, but present indications are that sales will not fall more than 10% under 1953 next year.

Steel production is high, but not at capacity levels. Business on the whole is still good and those most likely to feel the squeeze of closer pricing will be the marginal or high-cost producers. Economists are forecasting a drop of 10 to 15 percent for 1954. General opinion of industrial leaders is that competition will be stiff next year and there will be no more than a moderate decline in the overall picture.

Competition has forced many of the big steel firms to jump on the bandwagon of freight absorption to broaden their markets. As this trend widens, it will do away with the pressure on many industries to move in close to source-of-supply centers to keep their own costs down. The elmination of this condition, forced on industry by the New Deal, will make for a healthier and more normal distribution of steel.

Aluminum production is growing by leaps and bounds, having increased around 400% in the last 10 years, and now exceeding the combined output of copper, lead and zinc. Plans in the offing indicate a further increase of 500% by 1975.

Copper prices have held fairly firm around 30 cents, but it is anticipated by some that there will be moderate declines in 1954, if not before. Presently, supplies have been cut down by strikes at home and in Canada, but this is a temporary condition. Buying is proceeding on a hand-to-mouth basis, so that price changes, if they come, will not find users with large stocks on which to write off higher costs.

Wire mills are still finding business slack. Order backlogs are down and future order scheduling is slow. Some of the slow demand is attributed to inventory adjustments. Screen wire, fastener stock and most manufacturers' wire items have open capacity, although oil tempered wire is not readily obtainable and merchant wire for farmers and the construction industry has shown some improvement. Small assembly fasteners are in especially easy supply, with orders for most types of wire being filled promptly. However, some bare wire manufacturers are looking for a pickup in the pace of business this fall and winter, and electric wire and cable makers are anticipating good business in the coming months.

Unfortunately, the Congress has not been willing to reduce government expenditures drastically. Taxes will be cut moderately and this, without cuts in government services, will make deficit spending for the next two or three years a necessity. Most Congressmen are willing to see cuts made elsewhere, but not in their home territories. And should deflation seem probable, the old expedient of public works spending to "prime the pump" may be revived.

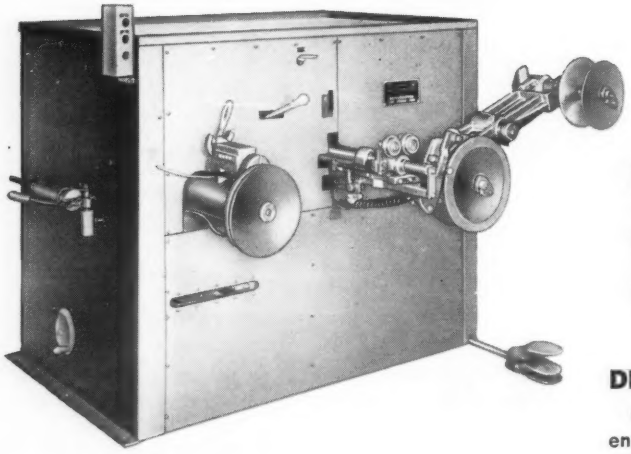
Layoffs, while having much publicity in the press, are scattered and have not reached serious proportions. Unemployment figures jumped over 2 million in September, but it has been pointed out that most of this could be attributed to young people who worked in the summer and who gave up jobs to return to school and college. The official figure now stands at around 3 million.

One of the most encouraging factors in the outlook is the wholesomely optimistic attitude of business leaders. There are pessimists, to be sure, but businessmen are showing no signs of hysteria. Everyone is aware that adjustments must be made and it so happens that we are in a period of this kind now. It may be unpleasant, but it is healthy and will lay the basis for a sounder future.

—from the Editor's Desk

Double-head Coiler

Class F



Type FV-D-CW

For coiling or spooling consumable electrode wire.

DESCRIPTION

Coiler is of heavy fabricated construction totally enclosed by sheet metal panels. Right or left-hand assembly can be furnished.

The unit is furnished with a centralized lubrication system which eliminates the necessity of stopping the machine when lubrication is necessary. A mechanically driven predetermining counter is also provided which automatically stops the machine when the correct footage has been delivered to the spool.

The traverse bar is fixed with the traverse guide consisting of two fixed rolls that slide horizontally on the bar. These rollers precast the wire being wound. The tension of the wire between the capstan and the spool is pneumatically regulated and can be adjusted while the machine is running.

OUTSTANDING FEATURES

- Coiler is double-headed. Finished coil may be tied and removed from one head while other head is winding.
- Constant wire speed; variable from 350 to 1050 feet per minute, infinitely adjustable over the entire range.
- Reel shaft drive compensates for the diameter build-up of the spool by a slip clutch.
- Two traverse trip mechanisms are provided: one is tripped by dogs adjustable over range of spool or coil sizes, the other by the spool flange to compensate for uneven spools.
- Traverse mechanism infinitely adjustable through any 7 to 1 ratio.

CONDENSED SPECIFICATIONS

Maximum coil size	20" O.D.
Maximum coil weight	100 lbs.
Maximum wire speed	1050 ft./min.
Motor	3 H.P.

Assembly — Right or left-hand assembly can be furnished. (Right-hand assembly shown in illustration.)

SEE CAT. SEC. 5G

See Page 1225 for a complete listing of JLE Products for the Insulated and Bare Wire Industry.

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WIRE
AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 28 NOVEMBER, 1953 No. 11

The Properzi Process for Continuous Casting and Rolling of Aluminum Redraw Rod

by Frank R. Nichols, President
Nichols Wire and Aluminum Co.
Davenport, Iowa

This paper was prepared for presentation before the Annual Convention of The Wire Association on November 11, 1953 in Chicago, Ill. Since the last article was published in Wire and Wire Products in July, 1951, the equipment has undergone many major improvements that Mr. Nichols describes in his paper.

The continuous casting and rolling of metals, although it has been the subject of much thought by metallurgists and engineers here and abroad ever since Bessemer, may be said to be a new and revolutionary art, with profound economic significance. Such a new art, so far removed from conventional practice, must of necessity undergo a period of trial and error with all the consequent encouragements and discouragements involved.

★ ★ ★

Within the past few years, the interest in continuous casting has become very keen and there are several processes and a number of ideas presently being developed.

★ ★ ★

That process which is in the greatest commercial use throughout the world today is the Properzi Process for the production of nonferrous redraw-rod. This process takes its name from the Italian inventor **Ilario Properzi** of Milan.

His company, **S.p.A. Continuus,** Milan, Italy, manufactures the operating equipment. Properzi Continuus equipment is in constant use and on order in the world today in accordance with the following table:

LEAD & ZINC — ALUMINUM

Machine:	Type 3	Type 4	Type 5	Type 5A
United States			7	1
France	1	1		4
Italy	1	2		1
Switzerland		1		
Belgium	2			
England	1			
India			1	
	5	4	8	6

As can be seen there are 18 machines now in operation or on order for the production of ALUMINUM REDRAW ROD with an average capacity of approximately 1,500 lbs. for machine per hour. The extension of this figure for an eight hour day, two hundred and forty day year, results in an annual capacity of 25,920 net tons, or 51,840,000 lbs.

★ ★ ★

This capacity has come into being within the past four years, and substantiates the commercial practicality of the process.

★ ★ ★

Mr. Properzi first became interested in the possibilities of continuously casting and rolling metal because of his development of machinery for the manufacture of lead shot a number of years ago.

The process requires the use of a lead wire which is flattened and then is passed through rolls with matching indentations. This shot making equipment created the need for an economical method of manufacturing lead wire, as well as a cheap method of utilizing the perforated lead tape scrap.

★ ★ ★

The Properzi shot-making machines produce to close tolerance, and they are the most generally used machines for making shot in Europe. Because of the need for lead wire generated by these machines, Properzi intensified his experiments in connection with continuous casting and rolling, and these ultimately were successful on lead, which has a melting point of approximately 618°F., and which is probably the easiest of all non-ferrous metals to melt, cast and roll.

★ ★ ★

The next step forward was taken on zinc. Just prior to the outbreak of war in Europe, Properzi developed his continuous casting and rolling process to a point at which the production of zinc wire was possible. The melting point of zinc is 787°F., and zinc, of course, while relatively soft, is still harder than lead. During the war, Properzi had a unit working around the clock on zinc metallizing wire.

★ ★ ★

There could be no general knowledge of the progress that Properzi was making with respect to the casting and rolling of both lead and zinc, because of the fact that Italy was an enemy country during most of the war. It was not, therefore, until after the war that any information was generally disseminated about his work.

★ ★ ★

Mr. Properzi has long been an important user of metal in Italy, and as a result has very close connections with Montecatini, the large Italian metals and chemical company. At the termination of the war, the economic situation in Italy was desperate. Industrial northern Italy had been badly bombed, and many important facilities had been knocked out. There were no modern rolling mills for production of aluminum redraw rod, and no way to get a conventional rolling mill going within a reasonable length of time without the expenditure of very substantial funds, which were not available.

★ ★ ★

Because of the confidence which the Montecantini group had in Mr. Properzi, he was asked by them to try to develop his process for the production of aluminum redraw rod. The melting point of aluminum is approximately 1250°F., and of course, it is a much harder metal than either zinc or lead and the problems, consequently, were greater.

★ ★ ★

The interesting thing about these various steps is that by good fortune they were logical, that is, that it was possible for Properzi in his developmental work, to progress from the softest metal to harder and harder ones with constantly higher melting points.

★ ★ ★

There is a great difference, which will be pointed out in the course of this article, between the original machines which operated on lead and zinc, and the most modern machines which now operate on high purity aluminum and some of the aluminum alloys. For example the cross-sectional area of the triangular section (Type 3) that was primarily used on lead and zinc was approximately .275 sq. inch.

★ ★ ★

The next larger section which was used by the first mill which the **Nichols Wire & Aluminum Com-**

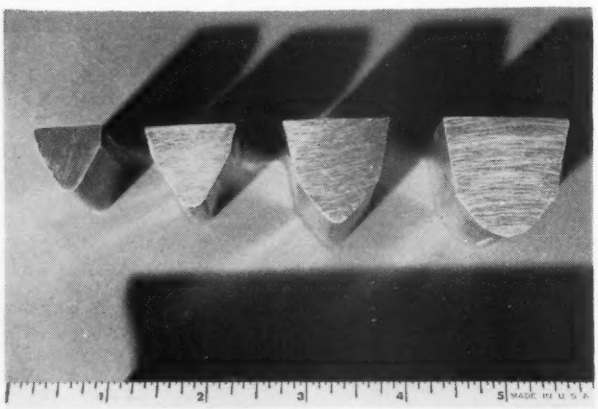

Fig. 1. (above) Sections of Castings showing development. From left to right Type 3, Type 3A, Type 4, Type 5A. *

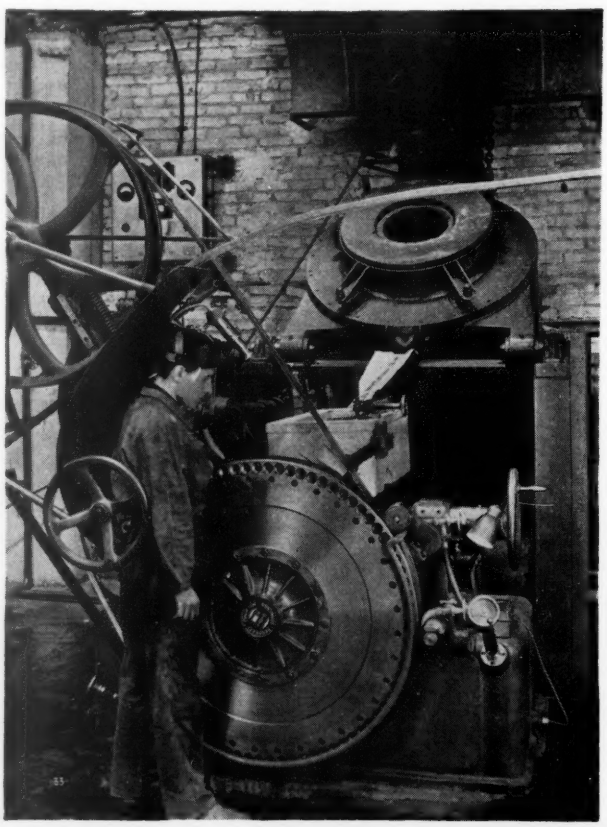

Fig. 2. (right) Type 5A Casting Wheel in operation at the Plant of S. P. A. Continuus, Milan, Italy, using an experimental Furnace.

pany brought to the United States (Type 3A) was approximately ½ sq. in. The next-section, Type 4, which is in commercial use in this country today by a number of firms, is approximately ¾ sq. in., and the latest models, Type 5 and Type 5A, cast and roll a section which has 1.2 sq. in. of cross sectional area (See figure 1).

★ ★ ★

One of the desirable features, of course, with respect to continuous casting and rolling is that the very substantial capital expenditures which are required by conventional techniques are greatly minimized, and this becomes even more pronounced as the size of the cast section is reduced. The Properzi Process successfully casts and rolls the smallest cross-sectional area of any continuous casting process in the world, and the capital investment required is only about $175,000, including melting capacity.

★ ★ ★

In a continuous casting process, it is obviously desirable to eliminate as many variables as possible, from the introduction of the pig into the furnace, until the final processing. The Nichols Wire Company has conducted a program for control instrumentation in the United States and so has Properzi in Italy, with a view to making the operation as automatic as possible.

★ ★ ★

In this regard, the **Ajax Engineering Company**, of Trenton, New Jersey, has designed and developed an induction furnace, capable of delivering in excess of one net ton of high purity E.C. grade aluminum per hour, with a temperature variation of only plus or minus 5 degrees Farenheit.

★ ★ ★

The use of a single furnace for E.C. metal, minimizes furnace contamination, and lessens the possibility of oxide formation while pouring, since the furnace may be positioned much closer to the casting machine than can be the case if multiple furnaces are used.

★ ★ ★

The Nichols Wire and Aluminum Co. uses a multiple Ajax furnace set up, since it makes no E.C. wire and is interested in the production of alloys as well as higher purities.

★ ★ ★

The Process itself requires two basic pieces of equipment, a casting machine and a rolling mill, which are operated by three men. A general description of the process is that molten metal is poured into a small holding furnace on top of the casting machine, from which the metal is bottom cast through a spout into a rotating grooved wheel. This grooved wheel is made of copper for purposes of heat transfer. The shape of the casting is approximately triangular. An endless belt kept under tension by means of an idler covers the casting wheel through 180° arc, and when this belt comes in contact with the grooved wheel a cavity is formed. The molten metal is introduced into this cavity and as the wheel rotates, the cavity is being constantly replenished and the metal already received is chilled and solidified.

★ ★ ★

It emerges after a 180° turn of the wheel as a solid bar (See Figure 2) and is conducted in an arc over the machine and introduced into the 13-stand rolling mill.

★ ★ ★

Each rolling stand of this mill has a group of three gear driven rolls, positioned at 120°. The rolling sequence is from triangle to round, etc. The rolled rod can be taken off the mill at any round pass (See Figure 3). After the rod has been rolled to the desired diameter, it is coiled up very simply by spilling it into a round sheet metal receptacle which produces an even coil of redraw rod without tangling and with all the rings of the same diameter. The bundle of rod so coiled comes off flippers or reels with a minimum of difficulty (See Figure 4).

★ ★ ★

An important consideration is that space requirements are small. it being possible to operate efficiently in a space of approximately 25 feet by 65 to 70 feet.

(*Please turn to page* 1229)

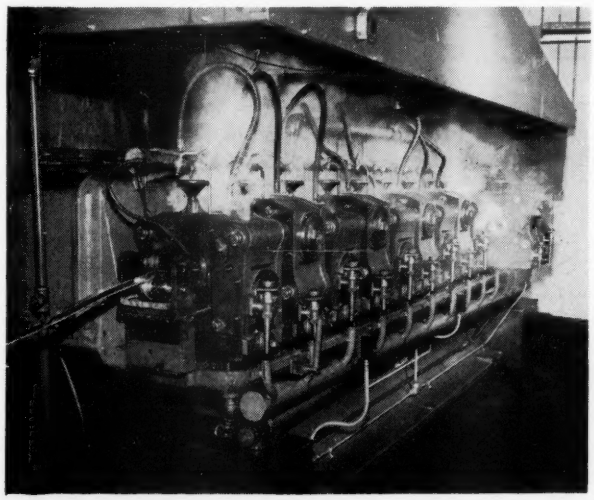

Figure 3—Rolling Mill in operation at Nichols Plant, Davenport, Iowa, showing ⅜" Rod being produced at ninth Stand from Type 4 Casting.

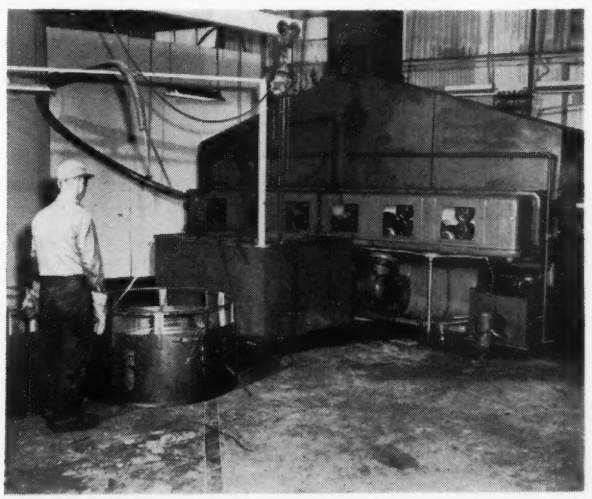

Figure 4—Rod being coiled by spilling into sheet metal receptacles of desired bundle Diameter. * * * * * * * * * * * *

Quality: The Key to Economical Use of Diamond Abrasives

by C. Randolph Myer
Manager, Abrasives Division
Elgin National Watch Company
Elgin, Illinois

This paper was presented before the Annual Convention of the Wire Association in Chicago on November 9, 1953.

The author was born on June 6, 1921, in Elizabeth, New Jersey, and graduated from Princeton University with a B.S. degree in Aeronautical Engineering. Went directly from college to the Naval Air Corps. After overseas service, he was discharged as a Lieutenant. Spent two years with United Air Lines in Chicago, doing Labor Relations work. He joined The Elgin National Watch Company in 1948 as Sales Engineer and was made Division Manager in 1951.

When one undertakes a discussion of industrial diamond with men of the wire industry, he has a situation best described by that old chestnut "carrying coals to Newcastle." You men, as a group, represent more productive "know-how" and have been using diamond abrasives in large production quantities longer than any other segment of industry. Recognizing that, I will attempt to give you facts and information which will be helpful in the intelligent purchasing and use of diamond.

★ ★ ★

First, let us see why diamond is so important to your operations. We all know it is the hardest material there is. However, that's like saying a Cadillac is the most expensive car on the road, which well it may be, but not **how** expensive.

★ ★ ★

Back years ago, they developed a scale of hardness known as the Moh Scale which stated the relative hardness of materials in terms of which materials would scratch which, and they came up with something like this. (See Fig. 1.)

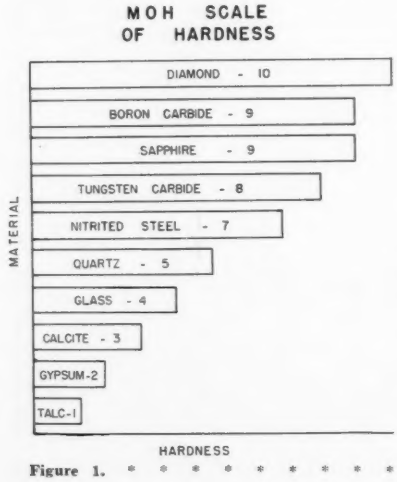

Figure 1. * * * * * * * * *

C. Randolph Myer * * * * *

You will see diamond as ten, or the highest; boron carbide and sapphire at 9; hardened steel 7, and so on. However, it didn't tell you how much harder one was than the other.

★ ★ ★

So in recent years they have developed the Knopp Scale of hardness with quantitative amounts for the hardness. It wasn't until then that you were able to say diamond was four times harder than carbide and so on. Now why are these quantitative hardnesses important to you? Because hardness is almost directly proportional to speed of cutting of the abrasive. Here is a chart developed by the Carborundum Company in 1935, showing this relationship between hardness and rate of abrasion or cutting. So we see when we are abrading, or cutting tungsten carbide, the hardness of the abrasive determines the amount of labor time required to complete the job. Obviously that's why the wire industry uses as much diamond as it does. On the other hand, however, we know considerable quantities of boron carbide, or Norbide, are also used, and very logically so because the automatic ripping machine was developed requiring very little labor time. Hence speed of cutting was not so important.

★ ★ ★

It might logically follow then, why not develop a completely automatic system to permit use of the much less expensive boron carbide? Elgin had the same thought several years ago, wondering why the manufacturer didn't sell it in finer grits than 600. So we set about crushing and grading boron carbide to the finer micron sizes, possibly for a compound. We found boron carbide and all the other man-made abrasives lose their characteristics of strength in grits finer than the 600-900 range. The particles collapsed immediately . . . just turned to dust. So it was we discovered only diamond maintained its strength in the full range of particle sizes. To obtain finer finishes, finer than a 600 grit finish, you are forced to go to diamond. It is only when you can accept a burnished finish that you can go to the cheaper, finer abrasives like rouge, levigated alumina, Turkish emery etc. But that is a subject in itself.

★ ★ ★

Now let's see where diamond comes from. Fig. 3 is a map show-

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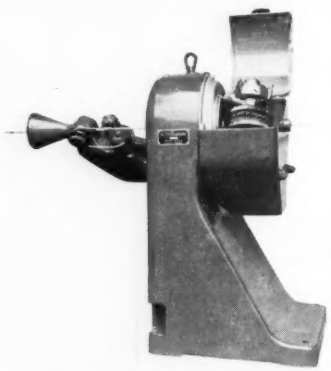

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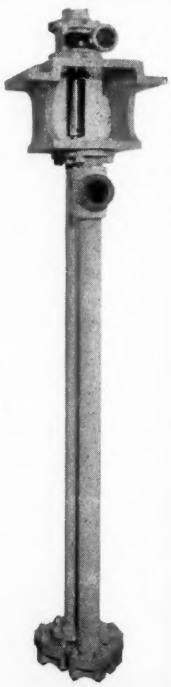

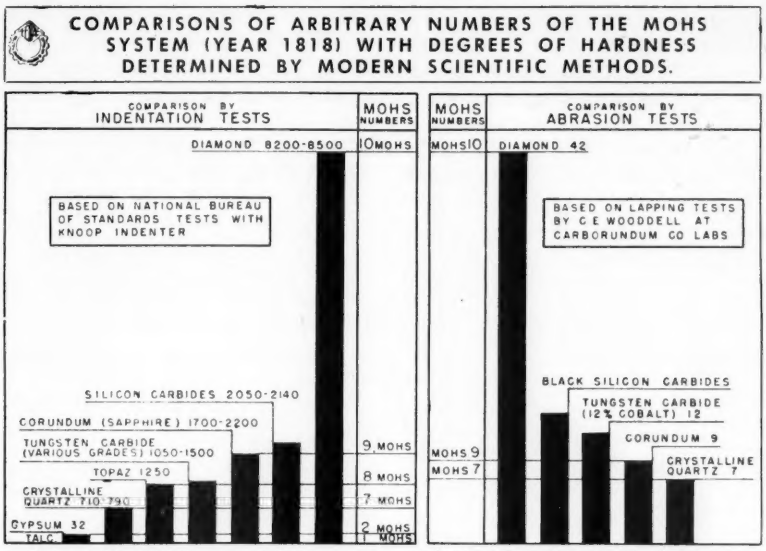

On this chart, the Mohs numeration is compared with the actual results of tests for hardness by abrasion and by indentation. The latter are based on tests made and reported by the National Bureau of Standards (Knoop, Peters and Emerson, 1939) The abrasion test figures are based on report by Charles E. Wooddell, Director of Research and Development, Carborundum Co. 1935, and on correspondence between I.D.A. and Mr Wooddell, June, 1947, and convey a particular indication of the toughness of diamond.

Figure 2.

Figure 3—Diamond bearing areas of the world.

ing the diamond bearing areas of the world. Although fairly widespread, 95% of it comes from Africa. And the reason for that is the economy of mining, and at best it is a costly operation. The most efficient diamond mine in the world moves four tons of earth for every carat of diamond obtained. More than 100 billion pounds of earth were moved for 1952's industrial diamond production. That's a heap of digging.

★ ★ ★

After a sequence of operations to get the diamonds out of the ground, the final step is the selection of stones. First, obviously the gem quality is removed. Then the high grade industrial for tool stones, die stones, etc. What is finally left from this culling is known as boart and is used strictly for crushing purposes. What's more all boart, regardless of its origin in Africa, is combined for sales, as such. Today there is no such thing as South African boart or West African boart from a practical standpoint because they are all mixed together. I make a point of that because occasionally we get orders specifying diamond from a certain region and it's absolutely impractical to comply with such requests. The only way to obtain such material is from the crushing of worn out die stones of known origin but there is relatively little of that available.

★ ★ ★

Now the great majority of industrial diamond is sold in this country and by total weight in carats boart is the biggest single item. About 85% of the boart goes to the manufacturers of diamond grinding wheels who crush it under hammers in a mortar-and-pestle arrangement. Naturally for the large volume producers this method is mechanized. The crushed powder is then processed through stacks of sieves that are vibrated, the coarsest sieve being on the top, the finest on the bottom. Depending on the sequence of sieves used, the diamond that goes to the bottom is known as 325 sieve and finer, or 400 and finer. Each sieve is then removed and the various sieve sizes emptied into dishes. The diamond is then thoroughly cleaned and washed as all diamond has impurities in it.

★ ★ ★

Now the main thing we are interested in is the material too fine to be caught by any sieve, or the 325 and finer. After it is completely cleaned it is placed in chemically pure water in a large vat, completely agitated, and allowed to settle a prescribed length of time. Obviously the larger particles settle faster and in time you produce layers or grades that might look as distinctive as this picture.

★ ★ ★

At prescribed time intervals each layer is drawn off into a separate container where it is again graded to insure positive grade control. The particles are allowed to settle completely, the excess water is drawn off and the balance is driven off by heat. The resulting graded powder is thoroughly checked under a microscope for purity and accuracy of grade. It is then ready to be mixed with a low viscosity oil to form the abrasive mixture.

★ ★ ★

A few comments on methods of grading. There are two basically different methods, elutriation and sedimentation. Both of them, of course, are based on the principle that the differential in mass of the diamond particles determines the amount of separation or gradations. Air elutriation is the least used in the diamond field because it is so inexact, or gives very poor grading of the particles. Simplified, the powder is placed in a stream of air which is circulated like a miniature tornado with centrifugal force acting on the larger particles, throwing them farther out. They are caught in vanes in the centrifuge and thereby removed by various grades. This is

very inexpensive and by the same token produces very poorly graded powder.

★ ★ ★

Water elutriation is not much of an improvement over air and operates on much the same principle. Diamond is mixed with water which is rotated rapidly. The larger particles are thrown to the outside, the finer ones remaining on the inside near the vortex, thereby being floated to the top of the whirlpool where they are drawn off.

★ ★ ★

The sedimentation method is based on the principle of permitting the particles to settle in a liquid, with gravity acting on the mass of the particles. There are two variations of this, one to settle in water, the other in oil. Many old-time tool makers feel oil-settled diamond is superior to water-settled and years ago that was true. First of all, your settling times are much longer in oil, permitting a much broader tolerance in settling times to produce the same grade. In other words, the margin of error in oil is much broader. Moreover, you could obtain in those days a much purer grade of oil than you could water so the two factors made oil settling preferable.

★ ★ ★

Some of this old-time preference for oil is still evident but it no longer has any basis in fact. Properly controlled, just as accurate grading can be produced by water, so neither has any technical advantages. The thing that makes water preferred by almost all processors is the great saving in time, which means a great deal less money tied up in processing inventory. Water settling is just about universally used.

★ ★ ★

We have now traced diamond right up to the use stage, which is the aspect most interesting to you. Let's now analyze what qualities in diamond abrasives are important to you as a user to produce the highest quality work on your dies in the least amount of time.

★ ★ ★

We have already seen where there is no other abrasive that will do the work of diamond, therefore we want to be sure when we buy diamond we are getting 100% diamond and all of the particular grade needed. Should the merchant supply powder that was 80% diamond, 20% Aluminum oxide (and, incidentally, the two materials are indistinguishable to the naked eye) your cutting speed would only be 80% of what it should be. So purity of diamond is extremely important.

★ ★ ★

The next factor is accuracy of grading, and this can best be visualized by the following slides.

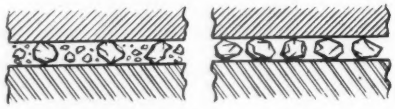

Figure 4—Schematic diagram of the effects of poorly graded diamond on the left and well graded on the right.

Here is a schematic drawing of diamond in the abrasive process. Now in lapping or cutting, which particles are going to do all the cutting? Obviously, only the larger particles with the smaller ones going along for the ride. The smaller ones only come into operation when the larger ones have broken down.

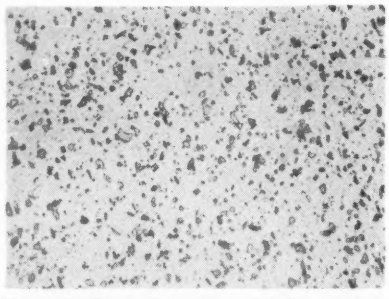

Figure 5—Photo of poorly graded diamond.

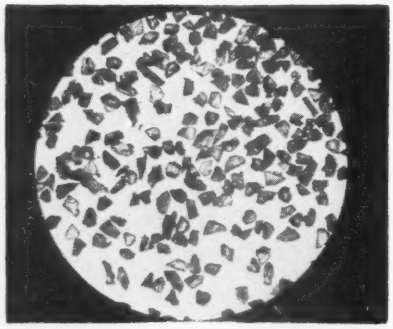

Figure 6—Photo of well graded diamond.

But then you don't have the same grade as when you started, which further reduces the cutting speed. Also the larger particles, when there are few of them, break down faster because there are fewer points of bearing to carry the load. Then too, the larger particles don't break down all at the same time, which means the large ones left will scratch the work. Yet when you buy diamond you pay just as much for the small particles that do no work as you do for the large ones that scratch. There's no economy in using poorly graded diamond.

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And the third factor is particle shape. There is a picture of the basic crystalline structure of diamond, an octohedron. In this shape

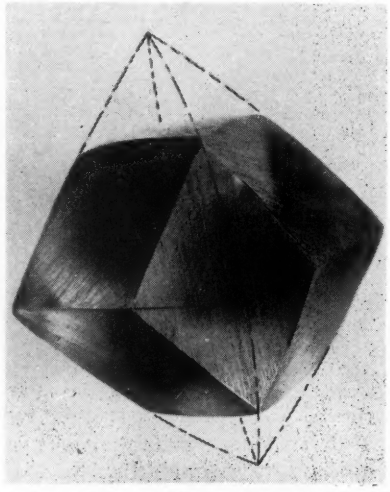


Figure 7—Basic crystalline structure of diamond.

the diamond has cutting points all over it, but an even greater advantage is that this shape provides maximum strength. It will stand up the longest in use. Therefore you want your diamond particles as close to this shape as possible. Under a microscope this will look blocky or cubical in shape as opposed to the long splinters you so often see. Also the long splinters very definitely cause scratching when caught in the right way.

★ ★ ★

So to produce your die work to the best quality in the shortest length of time, you want three things in your diamond powder.

1. **Purity**
2. **Accuracy of grading**
3. **Cubical particle shape**

"All right," you say, "how can I test for these things except by the results on my work?" The answer is, very easily and the same way we check in our own laboratory. All three of these factors, purity, grading and shape will show up under microscopic inspection. In other words, you should have a microscope. Now I have no financial interest in promoting the sales of microscopes, but to you men who invest $1,000 to $10,000 a year in diamond powder, it would certainly seem wise to spend $200 for a polarizing microscope of 100-200 magnification to insure the quality you need. By not using microscopic inspection of all the diamond you purchase you are inviting trouble. And I say that from experience, there are no bargains in diamond, no matter what anyone may say. As in the case of everything else we buy, we should demand to **see** what we are getting.

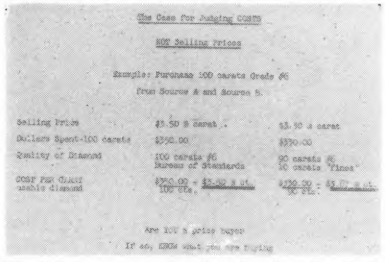
★ ★ ★

The techniques used by supposedly expert buyers of diamonds are frequently puzzling. First of all, they have a very expensive analytical scale to check the accuracy of the weight, and thus to make sure they are not being shorted on the weight. Or in buying compound they want to know how much diamond is in it. What is the concentration? But, gentlemen, short weight is an amateur's device. And let me show you why.

★ ★ ★

Let's say the going price of diamond powder properly graded to Bureau of Standards specifications is $3.50 a carat. You have a particularly attractive offer of guaranteed top quality material and the price is $3.30 a carat. You have been sold on the quality and the price is attractive, so you buy 100 carats. Your total bill is $330. However, microscopic inspection with a polarizing light would have disclosed 10% aluminum oxide mixed in the powder. To the naked eye the material looks identical to clean, pure diamond powder. So what have you bought? Essentially 90 carats of diamond at $330, which gives you a net per carat cost of $3.65 a carat — 15 cents

Figure 8—Photomicrograph of impurities in diamond powder. * * * * * * * * *



The Case for Judging Costs

NOT Selling Prices

Example: Purchase 100 carats Grade #6
From Source A and Source B

Selling Price	$3.50 a carat	$3.30 a carat
Dollars Spent-100 carats	$350.00	$330.00
Quality of Diamond	100 carats #6 Bureau of Standards	90 carats #6 10 carats "fines"
Cost Per Carat useable diamond	$350.00 ÷ $3.50 a ct. = 100 cts.	$330.00 ÷ $3.67 a ct. = 90 cts.

Are YOU a price buyer
If so, KNOW what you are buying

Figure 9. * * * * * * * * *

over the market. Again I say, there are no bargains in diamond.

★ ★ ★

And then there's something else to look for. Here I have to go back to manufacturing procedures to explain why this happens. When you crush diamond, or make little ones out of big ones, as they say on the rock pile, you invariably produce a certain quantity of "fines" and by "fines" we mean particles from 0-2 micron size. Now there is a very small market for this size range and you can't sell all you produce when you're in the diamond business. The Bureau of Standards specification on diamond grading limits the quantity of fines to 3% by weight or 50% by particle count that can be present in any Bureau of Standards grade. As a manufacturer, then, you produce to Bureau of Standards specifications and throw away this excess of 0-2 fines or you dump those fines back into the coarser grades to build up the total weight and thereby get paid for the "fines." Obviously, it is more costly to produce to Bureau of Standards specifications but we know this type of diamond does comparatively more work.

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Let's analyze more slowly what I have just covered, what the Bureau of Standards require and why that is important. Now here is a slide of a typical price sheet listing all the Bureau of Standards grades, going from the finest to the coarsest. Now what those numbers mean, for example in #6 grade, is that all of the particles of that grade are from 4 microns

(*Please turn to page* 1231)

Elgin declares that this diamond powder is in conformance with all requirements of Commercial Standard CS123-49, as developed by the trade under the procedure of the National Bureau of Standards, and issued by the United States Department of Commerce.

General Recommendations	Grade (National Bureau of Standards)	Micron Size Range	Mesh Size Equivalent	Compound Number & Diamond Content	Compound Color
Finest finishes for selected work—metallographic, optical, etc.	½	0-1	60,000	½-Universal	White
	1	0-2	14,000	1-Universal 1-Medium 1-Heavy	Ivory
Final finishing range for majority of jobs, depending on preparatory grades used.	3	1-5	8,000	3-Universal 3-Medium 3-Heavy	Yellow
	6	4-8	3,000	6-Universal 6-Medium 6-Heavy	Orange
	9	6-12	1,800	9-Universal 9-Medium 9-Heavy	Green
Preparatory finishing range for carbides, hardened steel, sapphire, beryllium, copper, etc.	15	8-22	1,200	15-Universal 15-Medium 15-Heavy	Blue
	30	20-40	600	30-Universal 30-Medium 30-Heavy	Red
	45	30-60	325	45-Universal 45-Medium 45-Heavy	Brown
Fast stock removal all materials. Hogging and ripping operations.	230 Mesh	.....	230-325	230M-Heavy*	Purple
	170 Mesh	.....	170-230	170M-Heavy*	Gray-Black
	100 Mesh	.....	100-120	100M-Heavy*	Black

*Compounds 230M-Heavy, 170M-Heavy and 100M-Heavy conform to Bureau of Standards requirements for sieve grading.

Figure 10. * * * * * * * * * * * * * * * * * * *

Production and Quality Control, Plus Mill Information — Sales Department Musts

by Eugene K. Wright
Sales Manager, Manufacturers Division
Continental Steel Corporation
Kokomo, Indiana

This paper, delivered at the Annual Convention of the Wire Association in Chicago on November 11, 1953, represents the sales department's point of view. It was felt by the Program Committee that a discourse on the problems of a Sales Manager would be refreshingly different and of great interest to the men who are producing rods and wire to be sold.

Of necessity, my remarks today will reflect the problems of and procedures generally followed by our own company, the Continental Steel Corporation. We are one of the smaller steel producers of the country, having five basic open hearth furnaces with a rated annual capacity of 394,000 tons. We produce low carbon and medium low carbon steels, and our product mix is composed of sheet steel, wire and wire products. We have just completed the installation of a new continuous rod mill with a capacity sufficient to convert all the steel we produce, if conditions warrant.

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I want to talk to you today about production and quality control, how they are related, and how they assist the sales department in the work it must do to keep orders coming in. I shall confine my remarks to problems that arise in connection with the sale of wire and wire products. I submit herewith 5 points for your consideration and discussion. If measures are taken in your plants to apply these 5 points, I am sure you will have the wholehearted blessing of your sales departments:

POINT NUMBER 1
Produce and ship quality products.

POINT NUMBER 2
Keep your sales department advised of your estimates of availability and production of raw materials and semi finished steel.

POINT NUMBER 3
Establish and use good scheduling procedures, with reasonable flexibility for changes in specifications and/or delivery.

POINT NUMBER 4
Closely scrutinize mill copies of customers orders, covering given grades, sizes and finishes of wire, for deviations from previous production ordered by the customer.

POINT NUMBER 5
Keep sales advised of production difficulties or improvements.

★ ★ ★

Now for just a moment, let's go back and analyze these 5 points individually.

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Take point #1 — "The need to produce and ship quality products." Let's see how we've handled it during the last decade. Ever since 1940, the entire wire industry has been operating at or near capacity. During this period of time, customer demand has exceeded supply for almost all the products of our industry. This condition, sorry to say, has generally been conducive to a gradual decline in quality. With heavy demand and constant pressure by the sales department for more production, material of sub-standard quality was sometimes shipped. Because of this peak demand, customers were hesitant and almost afraid to complain, for fear of offending their source of supply. We believe you all will agree that you know of cases where scratched, underfilled or scabby wire were reported by customers, but with only a mildly voiced request — mind you — that our respective mills strive to do better on future shipments. When your sales departments investigated complaints, made during this sellers market, they undoubtedly found that many of them were justified. Of course, we all recognize the difficulty in locating defective wire in the middle of a coil, for example, where gagers and inspectors cannot see; however, neither the sales department nor the customer can understand how scabby, slivered and seamy wire can be passed by inspectors as a prime product if such defects are plainly visible on the outside of the coil. In a buyers market, rejections by customers will climb rapidly unless rigid quality control is practiced. Returned material makes expensive scrap for your company. The function of our sales departments is to sell the products of our mills to our customers, but without the help of our mill people, it's a hard job to keep them sold. Prompt delivery, personal friendship, and past favors means little if poor quality products are shipped.

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It would be hard to overemphasize the importance of point #2. "Keep your sales department advised of your estimates of availability and production of raw materials and semi finished steel." This is of prime importance in the conduct of a sales program. For example, it has been the policy of our own operating department to give the sales department quarterly forecasts of billet and rod production. We can then plan our product mix and order acceptance accordingly. We do not mean to infer that we have not, on occasions, overscheduled our mill. I believe the most difficult task for a salesman, next to balancing his expense book, is to refuse an order.

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Assuming a "normal" competitive market, you should, for effici-

ent operation of your plants, forecast production as accurately as possible. If your estimate of future production is too conservative, your sales departments may reduce order acceptance accordingly, then, if the shortage does **not** occur, you will have your mill operations reduced for lack of orders. Conversely, if you are over optimistic in your estimates, and you fail to meet delivery promises — within reason — customers may be lost.

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Point #3 may appear to you to overlap point #2; however, we believe they cover separate and distinct problems. Assuming you have a good quality product to offer and a good supply of semi finished material, your sales departments are then well equipped to tackle the problem of building up good customer lists for your companies. I personally believe that a good customer list is a company's most important asset. If I were to pick a particularly important function for the mill, from the sales department's view, it would be good scheduling procedure. Assuming your company's salesmen can offer good quality products at competitive delivered prices, if they cannot come within a month of estimating delivery, I assure you the buyers will give them a short audience. Jobbing customers must have their material prior to the season in which their merchandise is sold. Except in a tight steel market, nails in October do little good for a building contractor, if he does not start framing a house until the next March. Fence normally does a dealer or jobber no good, if delivered to his stock during the harvest season. Neither does delivery of manufacturer's wire, at a time later than promised, help a customer if the delay has caused him to lose scheduled production during his peak season.

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Let me illustrate with a story: Last December, I called on a customer who told me of his difficulty in getting adequate shipping information from another of his sources of supply. He had tried for weeks to get information on the delivery of his orders, which were from one to four months past due. On this particular occasion, the customer had contacted the sales manager of the mill concerned, three times in seven days, seeking delivery information. The morning of the eighth day, the sales manager called the customer to explain that it would still be two weeks before any shipments could be made. The buyer courteously listened to the sales manager's story, explaining the further delay, and you can imagine the sales manager's confusion when the customer informed him that trucks loaded with all material, about which he had been inquiring for the past week, were even then at his dock waiting to be unloaded. I think you all can realize how embarrassing it would be for any sales manager to try to explain why orders were handled in the manner just described. This customer referred to this source of supply as "A firm which enters orders, turns the crank, and it's anyone's guess as to who's order will come out first."

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While prompt deliveries are highly important, shipping ahead of schedule also can be dangerous. Put yourself in the position of a sales representative trying to explain to a customer the arrival of 15 carloads of wire, in two days, when the customer had a siding for only 10 cars, and his storage bays were full. Even though, in this case, orders were accepted by the producing mill on what we call, an "If and When" basis—to be shipped if and when possible — with no definite promise of delivery, the customer was certainly entitled to more reasonable scheduling than this.

★ ★ ★

When scheduling orders, customers' requirements, and unloading and storage facilities must be carefully considered. After customers have been advised of these schedules, it is important that the promises be reasonably maintained for at least the following reasons:

1. **If they are manufacturer's, to enable them to maintain their production schedules.**
2. **To reduce the capital required for their working inventory.**
3. **To permit them to eliminate, so far as possible, obsolete material caused by changes in their production, or changed buying patterns of their customers. The lower their inventory, and the better you keep shipping promises, the less chance they take in getting caught with material of wrong gage, finish and temper.**

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You may remember that in point #3, I referred to "reasonable flexibility for changes." Assuming proper size rods are available, you can greatly help your sales departments by permitting quick changes in customers' orders. Of course, requests for changes must be held within reasonable limits. To you men of production, what real difference does it make whether the mill produces .342-inch diameter or .331-inch diameter bright industrial quality wire, but it could make a vast difference to the user. We must admit that certain demands can be unreasonable. For instance, one of our regional managers had an urgent call from a customer. They needed wire immediately. This call was received 3:30 p.m. Arrangements were made to ship the material by truck, to arrive at the customer's plant at 7:00 a.m. the following morning. When the customer was advised of the delivery we had arranged, at some inconvenience to our mill, he replied, "Can't you ship, so we get the wire tonight?"

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Point #4 may cause argument, but we feel that if you will closely scrutinize the specifications on mill copies of customer's orders, for deviations from previous production, you can greatly assist your sales departments. We are sure you can help eliminate the mistake of supplying material produced to the wrong specification. Earlier this year, our metallurgical department called my attention to an order that had been entered for bright basic wire. The tonnage on the order was rather large. Metallurgical department records indicated, in this case, that the diameter wire ordered by the customer had been specified during past years as annealed in process. This one call from our metallurgical department saved us from producing wire that would have been below the standard required by the customer.

(*Please turn to page* 1235)

Continuous Casting of Brass

by Daniel S. Ogden
Assistant Sales Manager
Continuous Metalcast Company, Inc.
New York, N. Y.

This paper was presented at a meeting of the Non-Ferrous Division of The Wire Association in Waterbury, Connecticut, on September 18, 1953. In his talk Mr. Ogden gave a brief historical background of the development of continuous casting and described in some detail the installation at the Scovill Manufacturing Company's plant in Waterbury, that the group was to see in a tour of the mills in the afternoon. The illustrations used in this article are shown through the courtesy of the Scovill Manufacturing Company.

It is appropriate that the discussion of continuous casting of brass, by the Rossi-Junghans process, should be presented in Waterbury today, for it was in Waterbury that the first commercial installation of this process was made, by Scovill Manufacturing Company.

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The continuous transformation of a flowing stream of molten metal into billets or bars, ready for the extrusion press or rolling mill, or other cast shapes, ready for immediate mill processing, has been experimented with by man for many years. Hundreds of patents have been issued, and fortunes spent, with victories and disappointments along the way.

★ ★ ★

The development of the continuous casting process, known as the Rossi Process, developed by the Continuous Metalcast Co., Inc. and the companies from which it evolved, has placed in operation more continuous casting machines than any other company. To date, some 15 commercial machines have been placed in operation, producing between 3 and 4 million tons of quality metal.

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Because the casting machines are fed continuously from holding furnaces, where the constantly maintained reservoir of molten metal acts as an "equalizer," the metal fed to the mold is amazingly uniform in composition. Analysis of samples taken at regular intervals from a brass machine, on a typical day's operation, bears this out. Determinations made on a Copper-Zinc-Lead alloy showed the extreme copper variation to be about one-half of one percent, and in lead content to be the same. Analysis on individual and consecutive heats from induction furnaces, on the same alloy, showed a copper range of over 3%, and lead of over 1%.

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Furthermore, pouring temperature, mold temperature and cooling rate are no longer subject to the judgment of individuals. They are predetermined for the specific alloy being cast and are then maintained as constant factors. The bars or billets produced today will be the same, in every respect, as those produced yesterday.

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Even though these production units have, on occasion, operated for many weeks at a time without shutdown, measurable changes in the character or composition of the metal produced are extremely rare. The Rossi process produces uniformly flat bars or sound billets, accurately dimensioned for succeeding "straight line" operations—ready for rolling or hot extrusion without further preparations—without waste.

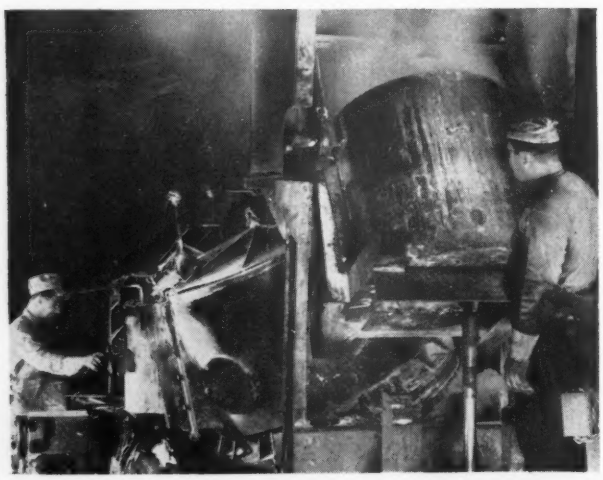


Fig. 1—Holding furnace intermixes charges as mold is continuously fed.

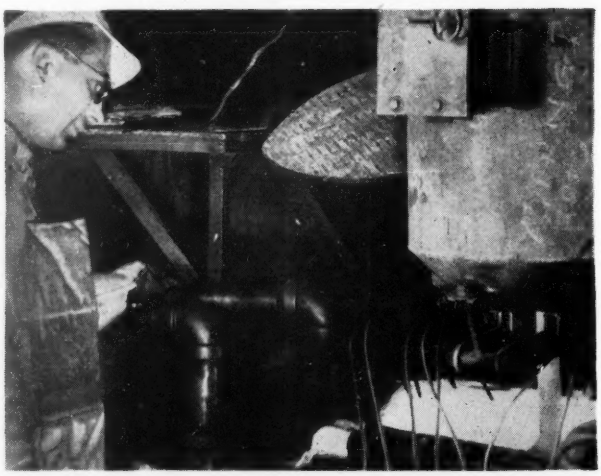
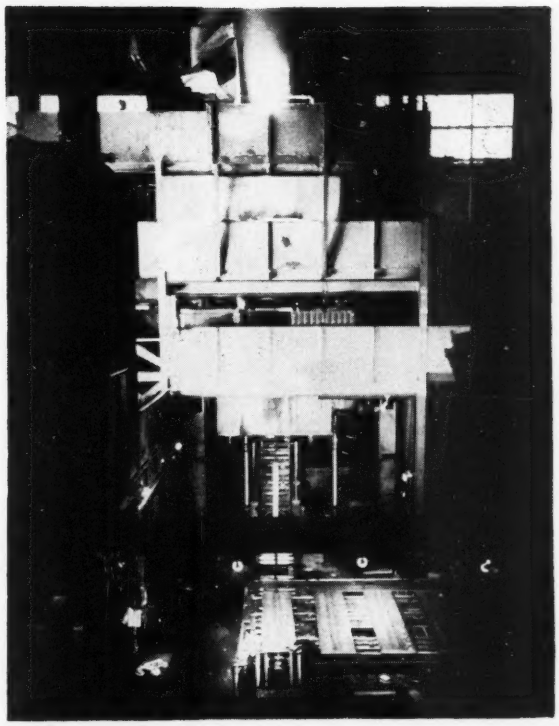


Fig. 2—Controls regulate continuous flow of metal into mold. * * * *

Above:
Fig. 3—Close-up of continuous casting apparatus that pioneered a new era in metal production.



At right:
Fig. 4—Bars are cast vertically and ejected onto table as seen at bottom of picture. * * *

As part of today's program you will visit the Scovill plant where you will observe full utilization of continuous casting. Here two machines supply the fabrication departments with billets and flat bars for extrusion or rolling. More than 90% of the metal for fabrication is produced by these two machines. The balance, made up of alloys in small quantities, is considered uneconomical to cast continuously.

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Three Ajax-Scomet low-frequency induction furnaces, of the most modern design, supply the flat bar machine, while a battery of modified Ajax-Wyatt furnaces supply the billet machine. The molten metal is transported in ladle by crane to the holding furnace above the casting machine, where it is fed to the reciprocating mold of the casting machine.

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The basic invention of the Rossi-Junghans machine is the reciprocating mold. The mold reciprocates in a vertical plane around the casting, which is constantly and independently being moved downwards by the withdrawing rolls.

★ ★ ★

The downward motion of the mold, during reciprocation, is in synchronism with the downward motion of the entire casting. The upward motion slips the mold up around the descending casting. Actuated by a cam, the motion upwards is about 3 times as fast as the downward motion, at any casting rate.

★ ★ ★

Metal is fed into the mold in constant flow, equivalent to the rate at which the casting moves downward. Thus, the metal pool surface remains at a constant level with respect to any nonreciprocating part of the machine.

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Roughly, one-third to one-half of the total heat removal is performed by the mold. The remainder of the heat is removed by water spray cooling of the casting upon emergence from the mold.

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The traction, or withdrawing rolls, are located beneath the sprays. These constantly turning rolls propel the casting downward into the cutoff saw assembly.

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On passing through the jaw clamps of the cutoff saw, and into the raised discharge basket, a measuring gage is actuated, which determines the cutoff length. When this length has been reached, a manually-operated hydraulic valve causes the jaw clamps to grip the descending casting. The counterweighted saw assembly is then urged downward with the casting. As the casting, saw and discharge basket slowly descend at the same speed, the cut is made and the cut length lowered, by means of the discharge basket, from the saw where it tilts and ejects the piece onto a roll conveyor for inspection.

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After the saw blade has returned from its cut, and the jaw clamps have been released, a motor driven clutch permits the operator to raise the saw assembly to its point of origin preparatory for the next cut.

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Aside from the brass machines, continuous casting installations are found in the aluminum, copper and steel industry. One of the most recent to go into operation is a machine for casting steel squares of 2″ x 2″ cross section, at unbelievable high lineal speeds. Projected thinking, to the point of

(*Please turn to page* 1246)

Rubber and Plastic Insulation in Cable

by R. A. Schatzel
Vice President and Director of Engineering
Rome Cable Corporation
Rome, N. Y.

A paper presented by the author at the second annual meeting of the Non-Ferrous Division of the Wire Association in Waterbury, Connecticut, on September 18, 1953. In it a history of the development growth in use of rubber and plastics compounds is given, with an appraisal of the various types of insulating materials presently available.

We are a vital part of the electrical industry; in fact, a basic ingredient. No useful application of electricity is possible except through the products we supply. We have undertaken quite a responsibility when we consider the rate at which the electrical industry is expanding. This is shown in Graph 1, and an appreciation of power growth in our country may be gained from the following statements of **B. S. England,** past President of Edison Electric Institute, in the G.E. Review for September 1953: "In just 10 years then, from 1945 to 1955, the electrical industry will have more than doubled its generating capacity from 50 million Kilowatts to about 115 million. At the rate we are advancing today we will have achieved in new power facilities the equivalent of all that provides electrical service now after some 70 years of development."

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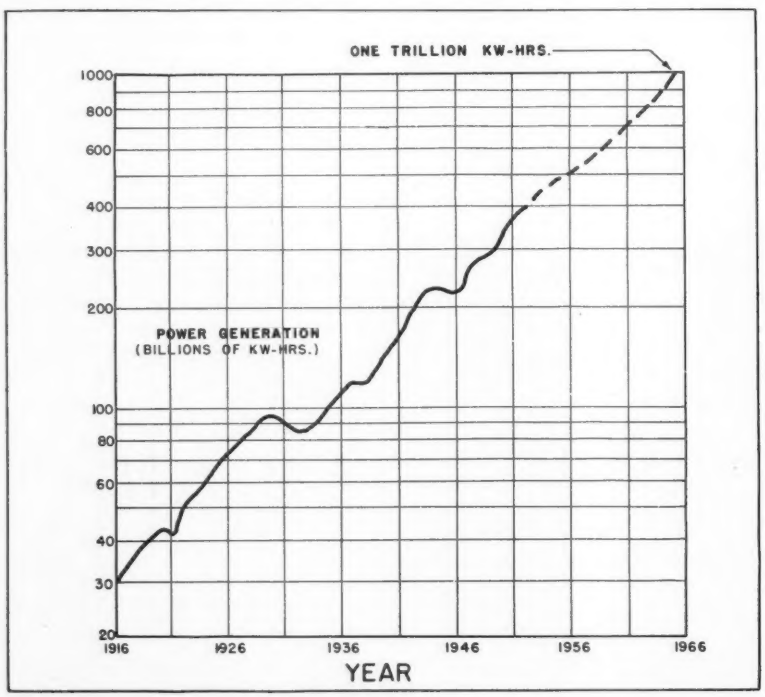
There seems to be no question but that this goal will be reached. Plans are being made to supplement the sources of power—hydro and fuels with atomic fuel; energy from the sun and sea tides. New sources of copper for conductors are being explored together with an increased use of aluminum to distribute the energy generated. We are primarily interested in containing this energy in conductors until its application is in a useful form. What progress are we making to keep pace with the demand for more and better insulations? Perhaps this question is more properly asked of the high polymer chemist. Does he sufficiently understand our needs? Do we know what we want, and how to evaluate what we have?



Graph No. 1

★ ★ ★

Perhaps if we review some of our progress and that of the polymer chemist we shall be able to find some answer. Below we show the production of polymeric materials in the U. S. projected through 1960. See Table I. The predictions are conservative estimates arrived at by **Dr. Winding** of Cornell University. According to most estimates this is 10 or 15% low. Even so, they seem adequate. The total of all these materials produced in 1960 would be a little over 11 billion pounds. The Paley report estimates that 22 billions of pounds of all plastic alone is probable in 1975, which is ten times the current production. 1975 is a long way off, and the near term still has technical and financial problems.

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It is comforting to see that our chemists are keeping pace with our engineers regardless of where they leave the bankers. We are interested in cable getting its share of these materials and it may be well to see what other applications compete for these same materials. Now let us look at some of the more important applications and types of polymers used. (We include natural rubber among the rubbers). See Table II. To this list should be added conveyor belts, footwear, and dishes as major consumers of rubber and plastics.

U. S. PRODUCTION OF POLYMERIC MATERIALS

	MILLIONS OF POUNDS PER YEAR				
	1946	1950	1952	1956	1960
REGENERATED CELLULOSE	900	1,200	1,200	1,300	1,400
CELLULOSE ESTERS	400	600	600	500	500
PHENOLICS	260	400	460	550	600
UREAS AND MELAMINES	100	200	230	350	500
STYRENE POLYMERS (EXCLUDING GR-S)	70	340	400	500	600
VINYL CHLORIDE COPOLYMERS	160	350	450	800	1,000
POLYESTERS	250	400	500	700	800
POLYAMIDES	25	100	170	300	400
POLYETHYLENE	10	50	100	400	700
ACRYLONITRILE COPOLYMERS (PLUS GR-A)	10	30	100	400	600
BUTADIENE-STYRENE RUBBERS (GR-S)	1,400	900	1,700	1,800	2,000
BUTYL RUBBER (GR-I)	200	150	180	250	500
NEOPRENE (GR-M)	110	120	140	160	200
NATURAL RUBBER	960	1,900	1,600	1,700	1,800
TOTALS	4,855	6,740	7,330	9,710	11,600

Table I.

When we see the number of applications and realize that our population will increase by about 15% in 1960, then any one of these materials which does not increase by more than 15% is either losing out or not contributing to the solution of our projected demand. However, our high-polymer friends may have other new types and numerous permutations of these to fill the gap. Advances are so rapid it is sometimes as difficult to keep up with the developments in polymers as it is with drugs. Somewhere I read the other day that they have developed a new wonder drug, so new that they have not yet discovered a disease for it.

★ ★ ★

The largest single type of polymer used in the wire industry is rubber—natural and synthetic. The wire industry consumes approximately 4% of the total rubber used in the United States, and tires about 70%. This proportion is not liable to change greatly. Because we depend on these materials as a dielectric as well as for mechanical protection we have exacting additional requirements in the polymers we use and not met with in any other application of rubber or plastics.

★ ★ ★

Uniformity of processing to meet close dimensional tolerances, uniformity of cure at high speed extrusion to comply with rigid specifications for physical and aging properties, and uniformity of electrical characteristics maintained on long exposure to moisture are necessary for us. In their aggregate these requirements are special for any other application of rubber. If we are to make this 4% accomplish the result we expect in the program before us, we need to enlist the co-operation of an interested and competent producer of synthetic rubber.

★ ★ ★

During the war and under Government operation we have had an Industry Technical Committee to study and guide the development of Polymers most suited to our need and to incorporate these requirements into specifications. During World War II we were fortunate to have the co-operation of Naugatuck Chemical Company and of **George Vila.** Through this co-operation, materials were made available and became the standard in the wire industry which were far superior to the then regular type of synthetic rubber. A standard of uniformity was established not approached by natural rubber. This benefited all rubber industry, and not one small segment alone.

★ ★ ★

Following the war, cold rubber polymers, now standard for the Wire Industry, were developed through the same co-operative effort. Now that Government development and controls are about over and private industry will soon take over the manufacture of GR-S, it is as important as ever that this 4% of the market—about 4000 tons per month to a supplier—should be alert and present sound technical guidance to the producer of both natural and synthetic rubber. Fortunately through the medium of committees of the Insulated Power Cable Engineers, American Chemical Society, and American Society for Testing Materials, we have instruments and a meeting-ground with producers who are eager to co-operate.

★ ★ ★

Instead of controls we need to develop an industry conscience as represented by sound specifications, practices, and recommendations. We can do this by using and supporting industry organizations dedicated to that purpose.

★ ★ ★

According to the International Rubber Study Group, the world picture on rubber is as shown in the table at the top of the following page.

★ ★ ★

When the excess of 270,000 tons is spread over all the countries of the world the margin of supply over consumption is small.

	Long Tons
Estimated Production of Synthetic Rubber	989,000
United States Production	905,000
Estimated Natural Rubber Total	1,788,000
Malaya and Indonesia Alone	1,300,000
Total Estimated Production	2,777,000
Total Estimated Consumption	2,504,000
Total Estimated Consumption United States	1,400,000

In this country our consumption of natural rubber is increasing while the production of synthetic rubber is rapidly decreasing according to the Natural Rubber Bureau Report of September 7th. Production of GR-S estimated as follows:

★ ★ ★

July	64,964
August	52,635
September	47,000
November	41,000
December	41,000

The rate for November and December being approximately 500,000 tons per year which is the minimum under the new disposal legislation. This is a reduction from 780,000 tons scheduled in 1953. The importance of this to us is at that rate the tire companies could consume all the GR-S produced in this country. Undoubtedly new methods and new facilities will be built, but someone is bound to get squeezed in the meantime.

★ ★ ★

Under the provisions of the disposal bill a production of 43,000 long tons of butyl rubber is insured. This year production was about 80,000 tons. Butyl has held a great interest for the Wire Industry and it has passed through a period of several years trial. This year the first Industry specification for butyl rubber insulation was issued by IPCEA. Under private ownership it is hoped that rapid progress will be made in the development of improved butyl polymers.

★ ★ ★

The availability of natural and synthetic rubbers has been well utilized to extend electric service. Better heat and moisture-resistant insulations have been developed and extensively used. The use of higher voltage distribution has been made possible through improved technology and refinements of old formulations of oil-base insulations. Still higher temperatures of operation are made possible through butyl rubber compounds. Both extremes of the temperature scale have been extended by the development of special Butadiene-Styrene Copolymers for service at —65°F., while silastics extend the range upward to above 200°C., opening a whole new field of applications.

★ ★ ★

Early in its development Neoprene commended itself to the wire industry, which is today the largest single consumer, about 30% of

(*Please turn to page* 1236)

MAJOR APPLICATIONS OF POLYMERIC MATERIALS

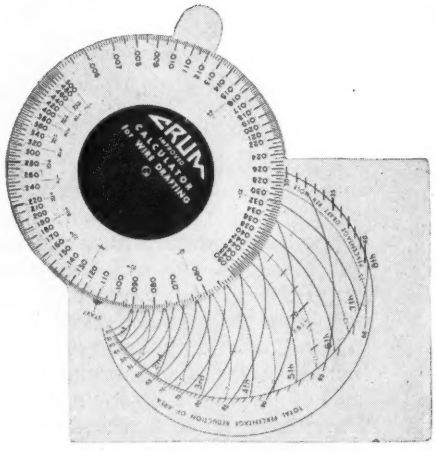
APPLICATION	PRINCIPAL POLYMERS
SHEETS	
PLYWOOD	PHENOLICS, UREAS, MELAMINES.
DECORATIVE	UREAS, MELAMINES, ACETATE, VINYL CHLORIDE, ACRYLATES.
STRUCTURAL	PHENOLICS, POLYESTERS.
ELECTRICAL	PHENOLICS.
FOAMED	POLYSTYRENE, PHENOLICS.
PIPE AND TUBING	POLYETHYLENE, VINYL CHLORIDE, CELLULOSE ESTERS, POLYESTERS.
MOLDINGS, GASKETS, ETC.	VINYL CHLORIDE, RUBBERS.
WIRE INSULATION	RUBBERS, VINYL CHLORIDE, POLYETHYLENE
FOILS	VISCOSE, POLYETHYLENE, VINYL CHLORIDE, CELLULOSE ESTERS, RUBBERS.
FILMS	VINYL CHLORIDE, POLYETHYLENE, RUBBERS, CELLULOSE ESTERS.
FLOOR TILE	VINYL CHLORIDE.
WALL TILE	POLYSTYRENE.
TANKS	POLYESTERS, PHENOLICS.
AUTOMOBILE BODIES	POLYESTERS.
COATINGS	POLYESTERS, BUTADIENE-STYRENE, PHENOLICS, UREAS, MELAMINES.
FIBERS	VISCOSE, CELLULOSE ESTERS, NYLONS, ACRYLONITRILES, POLYESTERS.
MONOFILAMENTS	NYLONS, SARAN, POLYETHYLENE.
ADHESIVES	(MANY).
PLASTISOLS	VINYL CHLORIDE.
SOIL CONDITIONERS	ACRYLONITRILES, VINYL ACETATE, CELLULOSE DERIVATIVES.
SHELL MOLDING	PHENOLICS.
LARGE MOLDINGS	
TIRES AND TUBES	GR-S, NATURAL, BUTYL.
CABINETS	PHENOLICS, UREAS, MELAMINES, POLYSTYRENE.
BOTTLES	POLYETHYLENE, POLYSTYRENE.
FURNITURE	PHENOLICS, UREAS, POLYESTERS.
MOLDED AND CAST ARTICLES	(MANY).

Table II.

THE NEW IMPROVED . . .

CRUM CALCULATOR

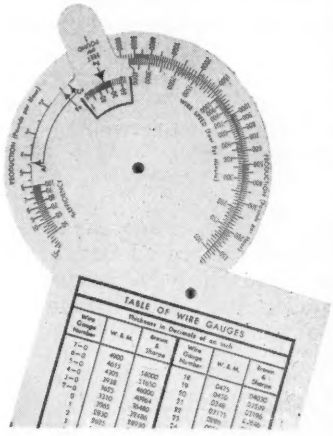
FOR WIRE DRAFTING



Front view of Crum Calculator.

THIS NEW DOUBLE-PURPOSE CALCULATOR WILL:

1. **Provide quicker and more accurate information on die sizes and reduction areas;**
2. **Calculate wire production rates for various speeds and efficiencies.**



Reverse view of Crum Calculator.

SOME OTHER FEATURES OF THE CALCULATOR

- Has new scale for more accurate determination of small percentages.
- Gives readings in B & S gauges.
- Intermediate lines provide reductions for 16 holes in one setting.
- New rectangular shaped back for better protection of calculator.
- More legible % draft-per-hole scale.
- Vinyl plastic construction, resistant to wear, warping, dirt, perspiration, wire drawing soaps—can be cleaned.
- Still fits your vest pocket.
- Handy tables of W & M and B & S gauges.
- Feet per pound calculating scale for steel, copper and aluminum wires.
- Durable, accurate, easy to use.

The new Crum Calculator is worth its weight in gold in time saving—no laborious mathematical calculations necessary with this Calculator. Instruction sheet with examples accompany each Calculator. You need one or more.

THE PRICE: $5.00 EACH

Send your orders to:

WIRE AND WIRE PRODUCTS

453 MAIN STREET **STAMFORD, CONN.**

(Exclusive distributors)

Marketing Conditions

by John S. Coe
Manager of Products
Chase Brass & Copper Company
Waterbury, Connecticut

In his comments on present and future conditions given at the second Annual meeting of the Non-Ferrous Division of The Wire Association in Waterbury on September 18, 1953, Mr. Coe presents a courageous and optimistic outlook that other business leaders well might check their own thoughts against. His talk was at once informative and inspirational.

In accepting the invitation to address you here I decided to review some studies we have been making about business prospects ahead. I shall try to pass along to you some of the thoughts and information we have received regarding economic conditions as well as future sales possibilities.

★ ★ ★

How many times in the last eight years, since VJ Day, have we been faced with what seemed to be a similar situation to that in which we now find ourselves?

★ ★ ★

Let's all think back to the end of World War II, and recall the situation at that time.

★ ★ ★

Employment had been built up to the then unbelievable figure of about 60,000,000 people.

★ ★ ★

The war was over. Defense spending was to be cut, almost to the bone.

★ ★ ★

Dire predictions were made that we would not be able to keep busy all the people who wanted to work.

★ ★ ★

Unemployment would increase rapidly it was forecast, and anyone who had lived through, or even read about the thirties, feared unemployment of course.

★ ★ ★

It would take six months to a year, or longer, for industry to reconvert to peace-time production. It had taken longer to convert to war production.

★ ★ ★

In the case of our own Company, we had a relatively simple problem and planned to build up large Mill and Warehouse stocks to hold our people and keep our mills operating during the period when our customers were changing back to peace-time manufacture.

★ ★ ★

What actually happened?

★ ★ ★

Industry changed from war to peace-time production almost overnight. Employment remained high. Demand for our products remained so high that we didn't get around to building those inventories and actually had difficulty producing enough material to meet the demand.

★ ★ ★

Someone may say, "But what about 1949?"

★ ★ ★

It is true that early in 1949 there was a letup in some business. Ordering cycles had gotten shorter. It wasn't necessary to carry big inventories or to order very far ahead and so industry, drawing on its own large inventories, caused a slackening of demand. By the middle of the summer, everyone in the business world was in a very pessimistic frame of mind.

★ ★ ★

At the time, I was in charge of our two plants in Cleveland. We received estimates from specialists, within and outside of our Company, who were supposed to have the answers as to the amount of business we could expect during the second half of 1949, and then in the year of 1950. If these estimates had proven accurate, it certainly would have been a pretty sorry situation.

★ ★ ★

But what really happened?

★ ★ ★

The consumer didn't worry about a letdown and "by mistake" went right along using up and buying with the result that business got better in spite of the crepe-hangers who said it couldn't happen. The situation changed again in late 1949 and by the first of 1950 business was again back to the level of before the let-down in 1949. The prospects for a record year in 1950 seemed very good indeed. Mind you, this was almost six months before the start of our "police action" in Korea, and a considerably longer time before defense spending had any appreciable effect on business.

★ ★ ★

Probably all of you, over the period of the last two or three years, have read some of the hundreds of articles, or heard some of the many talks, predicting anything from a slight recession in business to a full-fledged depression. Seemingly, every one has agreed we must have trouble. You know, it's fairly easy to be right saying "no", or to appear smart by taking a negative viewpoint. It takes courage to be positive and to decide to go ahead. It's a lot harder to make a "yes" decision and a lot more risky. It's pretty difficult to prove you were wrong when you said "no", even though that decision may have resulted in some lost "golden opportunities." People are inclined to go along with you if you forecast trouble, for many people are sure they are going to have it—it's only a question of time!

The principal reasons given for such a let-up in business were the lessening of defense spending and reports that the building industry had reached a saturation point.

★ ★ ★

As time has passed and business activity has continued at a high level, and even increased, those economists, who have been predicting a recession, have covered up by simply pushing the date ahead. Now I've got no quarrel with the economists. They have their place —but some, to gain attention, continuously forecast trouble, because such forecasts make bigger headlines.

★ ★ ★

Now, of course, they could be right if we wait long enough. But meanwhile, should we do only part of the business of which we are capable, or should we, with some imagination and courage, go ahead and make the profits this era can hold for us? Many of the same conditions and forces that prevented any appreciable let-down in business after World War II, and prevented any extended recession in 1949, along with additional upward forces are now at work for us.

★ ★ ★

Let's look at some of them:—

★ ★ ★

More than half of disposable income (that is personal income after taxes), as compared with approximately one-third prewar, is now available as discretionary spending power (that is the amount of income, over and above that required for necessities, such as food, clothing and shelter that is available to be spent). Discretionary spending power is up 4½ times over 1940.

★ ★ ★

It is even now estimated, about six months ahead, that disposable income during the first quarter of 1954 will be slightly **higher** than during the first quarter 1953. We were supposed to be in a depression **now** but the corporation statements I read don't show it. Nor do the present forecasts of business for the rest of the year.

★ ★ ★

There has been, and there continues to be, a large shift of population to the suburbs. This results from, and means, a change in living standards, and a change in shopping habits. This will increase the demand for suburban shopping centers and houses in the suburbs in which to live—new, modern houses, with all the appliances and gadgets.

★ ★ ★

The number of children under five has increased more than 65% since 1940. They, even now, require additional school facilities, hospitals, additional housing, food and clothing. These modern youngsters need, and will get, lots of things that will change many facets of family living. Between 1900 and 1953 longevity has increased from age 47 to age 68. Our 40 hour average work week means more time to buy, more time to do creative things.

★ ★ ★

The tremendous increase in the number of motor vehicles will require large expenditures for roads, streets, garages, and parking facilities, tires, gas and oil, and maintenance to keep them shining and to keep them going. Automobile manufacturers have a way of making you want their newest models.

★ ★ ★

The increase in the proportion of our population with a higher education, is increasing the pressure for more education, and higher standards of living. The number of adults with high school education has increased 80% since 1940.

★ ★ ★

Farm mechanization and productivity has helped to bring about amazing increases in standards of living and the purchasing power of farm families. 84% now have electric service, compared with only 11%, prewar. This means additional farm equipment and appliances will be purchased to make the farming job easier and the farms more productive.

★ ★ ★

Our annual population increase since 1950 has been in excess of 2,500,000. Think of it — between censuses we add 25,000,000 people or on the average about six million new family units! Each wants a home; wants it furnished and a car in which to get to it.

★ ★ ★

New construction, at an average rate of one million new homes per year, for the past few years has taken care of the backed-up demand resulting from the war and the growth in the number of families. Yet the majority of our present dwellings are over 50 years old and obsolete, and will require many changes and additions to satisfy the changed tastes, incomes, education, and needs of modern people. Then, too, the houses have to be where people want them to be usable. The house in a ghost town doesn't become a home in Oak Ridge.

★ ★ ★

Recently a nationally known authority pointed out that, **despite** higher taxes and inflation, the average man is much better off now than he was thirty years ago. During that time, and much of it is recent, his income has more than tripled, wh.le living costs have less than doubled. In addition we have Unemployment Insurance, farm price supports, guaranteed bank deposits, social security insurance, greater savings than ever, and remember, that underlying all this are union contracts to hold earning power up.

★ ★ ★

Economists, who for the last few years have been predicting a recession, on "new evidence," are taking a much more optimistic view, or, at the worst, putting off the day when trouble begins. They feel that, despite a reduction in defense spending, wages will remain high, and employment will be well maintained. I can't help but think, after all, if you were to remove five floors of the Empire State Building, it would still be quite a high building.

★ ★ ★

Very few people seem willing to recognize the fact that only a 5% increase over the 1952 level of consumer purchases in goods and services would offset a cut of $10 billion in government purchases, for we live in a $275,000,000,000

(*Please turn to page* 1239)

Non-Ferrous Division Holds Successful Meeting at Waterbury

by Edmund D. Sickels, Editor
Wire and Wire Products
Stamford, Connecticut

September 18, 1953, was the date of the second annual meeting of the Non-Ferrous Division of **The Wire Association,** which convened at the Elton Hotel in Waterbury, Connecticut.

★ ★ ★

Planned a year in advance by the Program Committee, the meeting justified the work that went into it through a gratifyingly large attendance. 227 persons registered.

★ ★ ★

Many people who had come from long distances, even as far away as St. Louis, arrived on Thursday and the Association's headquarters were crowded to capacity through the evening preceding the meeting.

★ ★ ★

On Friday morning the registration desk opened at 8:30 A.M. with a rush that did not let up until well after lunch.

★ ★ ★

Technical sessions were started at 10:30 A.M., with **Willard de Camp Crater,** Assistant Manager of Vinyl Sales for the Naugatuck Chemical Division of United States Rubber, presiding.

★ ★ ★

The first speaker was **Daniel S. Ogden,** Sales Manager of the Continuous Metalcast Company, New York City, whose paper, "Continuous Casting of Brass," proved to be of great interest, as evidenced by a full half hour of questions from the floor on various aspects and applications of the process.

★ ★ ★

He was followed by **R. A. Schatzel,** Vice President and Director of Engineering of the Rome Cable Corporation, Rome, N. Y., whose paper, "Plastic and Rubber Covered Cable," elicited much favorable comment following its delivery.

★ ★ ★

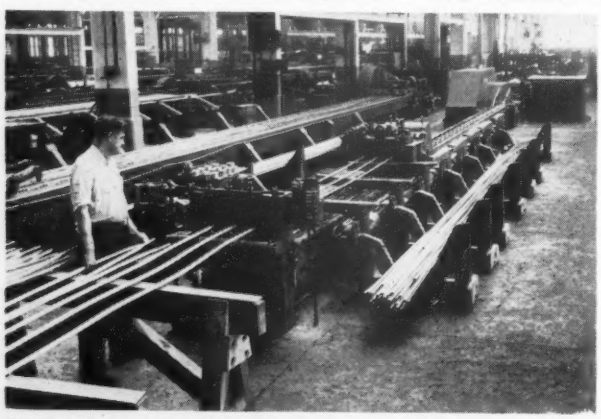
In this illustrated talk, Mr. Schatzel gave a history of the development of rubber and plastics for wire insulation and pointed out the great need for evaluating the properties of the current types of rubber and plastic compounds that are presently available for use in the wire industry. One man probably summed up the thoughts of the majority by saying his talk "was a real inspiration."

★ ★ ★

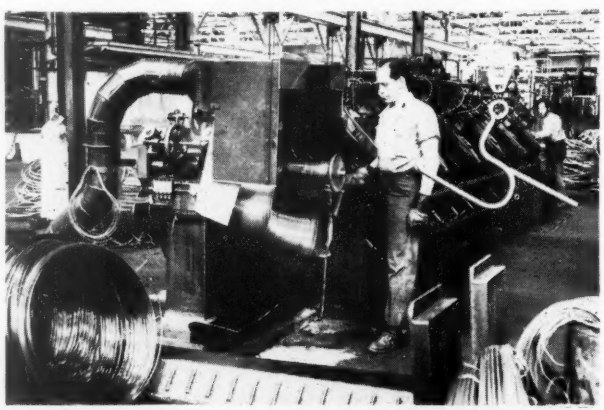
After lunch, the guests were transported by bus to the **Scovill Manufacturing Company** to visit the bar casting, tube, strip, rod and wire mills. As these mills are extensive and well-equipped, many guests had some difficulty in observing all of the operations of interest to them in the time at their disposal. Of especial interest was the 50 foot high continuous brass bar casting equipment described by Mr. Ogden in the morning. The mill has two of them to supply its mill products needs, in addition to a number of older types of billet casting furnaces that were in operation. The officers and directors of The Wire Association are grateful to the Scovill management for making this excellent plant inspection possible for our members.

★ ★ ★

With only a brief period for relaxation and cleaning up after the tour, a well-attended cocktail hour preceded the dinner, which began at 6:00 P.M.—a good one, too.

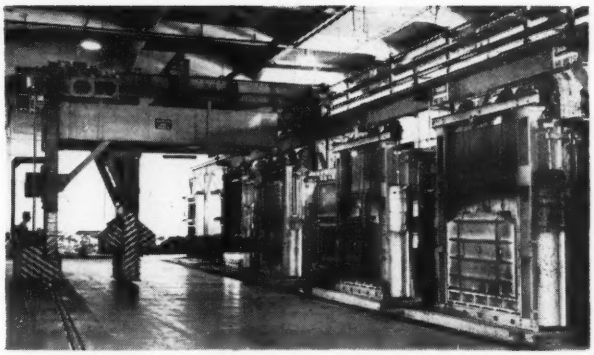


Drawing three rods simultaneously in Scovill Rod Mill. ★ ★ ★ ★



Rod rolling machine—¾" round rods are rolled to approximately ¼" square. ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

General view of material awaiting processing in the Wire Mill. * *



Wire annealing furnaces. * * * * * * * * * * * * *

William L. Wells of the Reilly-Whiteman-Walton Company and Chairman of the Program Committee, presided at the after-dinner meeting as master of ceremonies. Mr. Wells first expressed his pleasure at the fine turnout, and thanked his committeemen for their work, especially **Jim Flood** and **Bill Crater,** who had shouldered so much of the responsibility. He also thanked Mrs. Spengel for her work and welcomed her new assistant, Mrs. Johnson, to our midst.

★ ★ ★

Richard E. Brown, Executive Secretary of the Association, was then asked to address the group. He briefly pointed out the objects of the Non-Ferrous Division and invited those present who were not now Association members to become affiliated with the organization. He expressed the hope that this division would, in the near future, become as large as the Ferrous Division in numbers.

★ ★ ★

Mr. Wells also called upon **Ralph B. Roth,** Vice President of the Non-Ferrous Division of The Wire Association (and Vice President and Secretary of the Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.), who welcomed the group to Waterbury and voiced his gratification at the fine attendance at this second meeting of the Division.

★ ★ ★

L. C. Crewe, Jr., President of the Maryland Fine and Specialty Wire Company, Cockeysville, Md., and President of The Wire Association, sent a wire of congratulations to the members present on the success of the meeting, saying that he was sorry not to be able to attend in person.

★ ★ ★

John S. Coe, Manager of Products, Chase Brass and Copper Company, was then introduced by Mr. Wells as the principal speaker of the evening. Mr. Coe's talk was very much to the point in these times of doubt and provided a strong refutation of those economists' forecasts that are intended to be safely on the bearish side. Mr. Coe's address and those of the two speakers in the morning appear elsewhere in this issue of Wire and Wire Products.

The Committee responsible for the meeting was comprised of:

CHAIRMAN

William L. Wells, Sales Engineer
Reilly-Whiteman-Walton Co., Conshohocken, Pa.

MEMBERS

Willard deCamp Crater, Assistant Manager, Vinyl Sales
Naugatuck Chemical Div.
United States Rubber Co.
Naugatuck, Conn.
James E. Flood, Chief Chemist
Plastic Wire & Cable Corp.
Jewett City, Conn.
Edward O. Johnson, Superintendent, Wire Mill
Plastic Wire & Cable Corp.
Jewett City, Conn.
Benjamin McGar, Director of Research
Chase Brass & Copper Co.
Waterbury, Conn.
Kenneth D. Roberts, Engineer
Waterbury Farrel Foundry and Machine Co.
Waterbury, Conn.
William Schmallinger, Metallurgist
Chase Brass & Copper Co.
Waterbury, Conn.
Grayson B. Wood, Jr., Metallurgist
Scovill Manufacturing Co.
Waterbury, Conn.

Our thanks to you, committeemen, for a job well done.

A Special Message to Guests at the Convention...

If you attended the Annual Convention of The Wire Association in Chicago, profited from the sessions and enjoyed the several special features, we would like to have you join with us and take advantage of other meetings and services available to our membership. Send for a booklet describing the work of The Association and an application card.

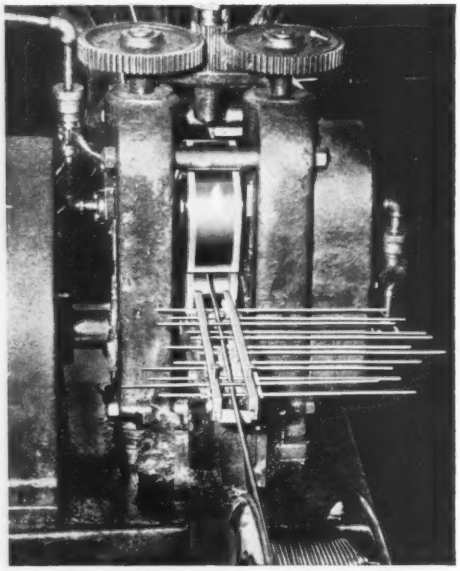
THE WIRE ASSOCIATION

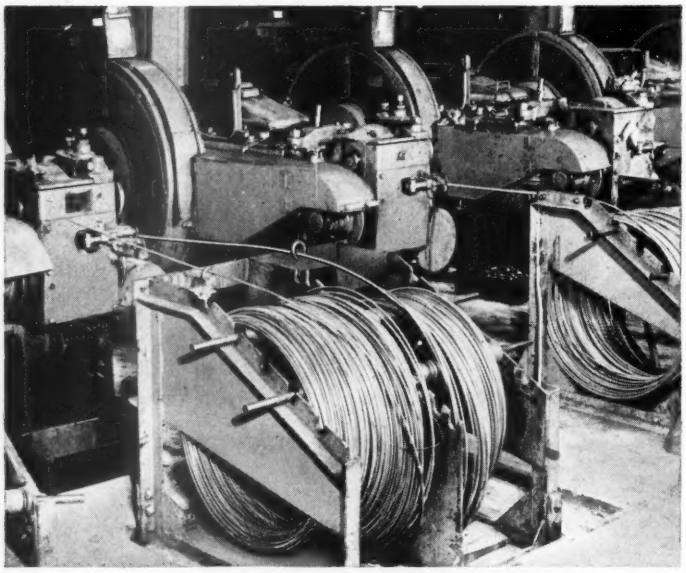
RICHARD E. BROWN, *Executive Secretary*

453 Main Street **Stamford, Conn.**

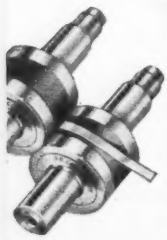
How Carboloy Wire Dies help you get top tonnage

1. Carboloy Wire Dies slash operating costs. Actual mill performance records prove carbide dies outproduce, outlast steel . . . save manpower.





Wire flattening rolls operate 12 months without spot change



Carboloy Wire Flattening Rolls do a high-precision, lustre-finish job; outlast steel up to 40 times. Steel rolls formerly used to flatten stainless steel wire into textile loom reeds required spot changes every two weeks. Carbide rolls flattened wire on the same spot for 22 months, with wear almost nil. Records reveal less rejects, finer finishes, important manpower savings.

Header dies outlast steel by 125 times

Carboloy Header Die Nibs and heading hammers outlast steel dies 125 times in these open-die cold headers. Used for upsetting the cone and forming the head of 3/8" bolts, Carboloy header dies produce over 5 million bolts compared to only 40 thousand with steel dies. Standard die nibs – always in stock – handle 93% of all bolt, screw and rivet requirements. Use Carboloy nibs, and you'll decrease downtime, maintain better tolerances . . . lower costs.

"Carboloy" is the registered trademark for the products of the Carboloy Department of General Electric Company

NOW . . . MORE THAN EVER, IT PAYS TO

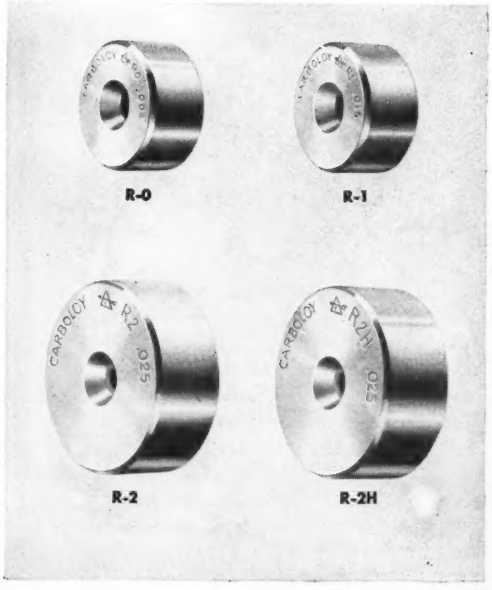
Specify **CARBOLOY**

CEMENTED CARBIDE WIRE, BAR AND TUBE-DRAWING DIES

and "bonus" services . . . at a savings

2. Carboloy round hole line expanded — in small hole sizes — to fill your exact wire die requirements at less cost.

Keeping pace with the growing demand for economical small hole dies, the Carboloy line now includes an R-O Die with a .004" cored hole size. New line also offers you a choice of two dies in the R-2 series. All prices are in keeping with the substantial price reductions which are now in force on most other standard Carboloy dies.



3. Fast deliveries help cut your inventories . . . reduce downtime. Comprehensive service program protects your carbide investment.

Large stocks of all standard Carboloy wire dies are maintained at Chicago, Detroit, Los Angeles and Pittsburgh. Because you can get prompt delivery from these central points, you can operate with more efficiency . . . on lower inventories.

The Carboloy Service Program — the largest, most complete in the industry — will help you get the maximum performance your Carboloy Wire Dies can deliver. See which of these services you can use. Then send in coupon below.

Die Service Centers.

Extensive facilities in Chicago, Detroit, Los Angeles and Pittsburgh will give you expert die servicing and finishing — fast.

Free Technical Literature.

The industry's most complete file of money-saving, timesaving wire die information is available, free, to help you order, use and service your carbide dies.

Tuition-free training school.

Modern, completely equipped Carboloy Die Training School at Detroit teaches your die-room personnel how to design, apply and maintain carbide dies.

Free die-engineering assistance.

Expert Carboloy Sales Engineers will work with you — in your own plant — on your tough design or performance problems.

Send coupon today for catalogs and information

CARBOLOY
DEPARTMENT OF GENERAL ELECTRIC COMPANY
11171 E. 8 Mile Road, Detroit 32, Michigan

I would like the following free Carboloy services, now:

- ☐ New price list D-133
- ☐ Die Catalog D-130
- ☐ Header Die Manual D-131
- ☐ Complete information on Die Training School
- ☐ Have a Sales Engineer call

Name_____ Position_____

Company_____

Address_____

City_____ Zone_____ State_____

Government Wire Production Information

September Bibliography of Technical Reports

Technical developments valuable to the metallurgical industry and latest improvements in instruments and machinery are described in the September issue of the Bibliography of Technical Reports, now available from the Office of Technical Services, U. S. Department of Commerce.

★ ★ ★

This issue features reports on such subjects as metal cutting and tool temperatures; temperature distribution and variables in flash welding; impact testing of high-hardness steels; the effects of fatigue on the tensile properties of steel, and the weldability of iron alloys. Also, a 3-phase motor for servo-mechanisms; new instruments for measuring water surface elevation and atmospheric electricity; exposure meters for X-ray and gamma ray radiography; studies in the adaptation of various vehicles for upper air experiments, the design of fire control optics, spectrophotometric methods of color measurement, and high frequency crystal-controlled oscillator circuits.

★ ★ ★

In addition, the September Bibliography includes many reports on advances in aeronautics, electronics, communications, and fuels and lubricants. Featured among these are the latest developments in an improved short-range air navigation system, light-weight insulating materials for jet engines, cabin-air moisture removal, and icing prevention and protection. Also described are a new microwave reflector and a new noise screening signal device; reports of research on radio interference, limiting impulse noise in FM receivers, qualification test methods for gear lubricants, and reaction processes in spontaneous ignition of hydrocargons.

★ ★ ★

In all, 279 reports are listed from the laboratories of the Federal Government, from industrial and university laboratories working for it, and from foreign government and other non-confidential sources. Most of these reports are not otherwise published.

★ ★ ★

Other technical fields covered by these reports include: Drugs and chemicals, food, medical research, meteorology, minerals, aptitude testing, photography, physics, rubber and rubber products, and structural engineering.

★ ★ ★

The Bibliography of Technical Reports sells for $.50 a copy (yearly subscription, $5.00) and may be purchased from the Office

MICROMETER PRECISION — MICRO-WELD — TRADE MARK REGISTERED

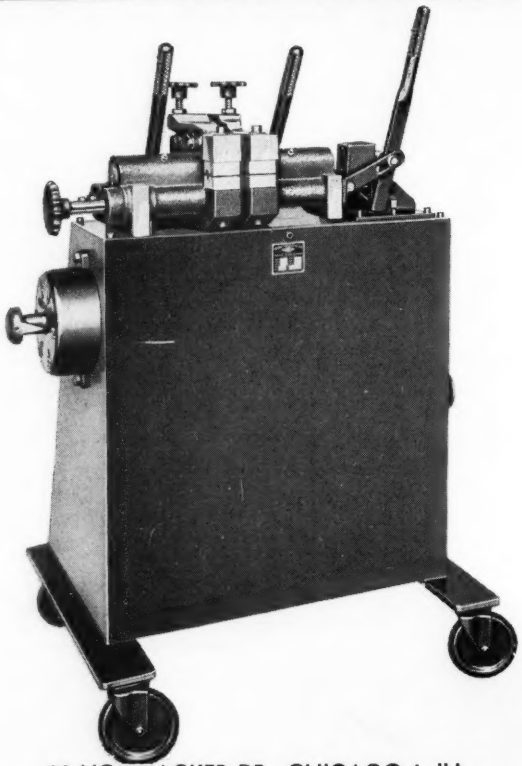
MODEL H-T MICRO-WELD
HEAVY BUTT WELDER

A general utility Butt welder for welding Steel low carbon rods and wire ranging in size from 1/8" to 7/8" diameter.

While this unit was not designed for production line work, the wide range in welding capacity makes it suitable for various types of welding requirements.

Equipped with hand-operated toggle type clamping mechanism, providing positive clamping of the stock. Spring actuated movable welding headpiece and close coupling of the transformer provides high efficiency on the welding current.

General construction of this unit is rugged to resist high upsetting forces, and to maintain accurate alignment of the work. Furnished mounted on 4-wheel-truck as illustrated.



MICRO PRODUCTS CO.,
20 NO. WACKER DR., CHICAGO 6, ILL.
Telephone: STATE 2-7468

of Technical Services, U. S. Department of Commerce, Washington 25, D. C., or through the Department of Commerce field offices. Make check or money order payable to the Treasurer of the United States.

More Aluminum Coming in Last Quarter

More than 101 million pounds of primary aluminum will be made available to independent fabricators during the fourth quarter of 1953, **Edmund F. Mansure,** Administrator of General Services, has announced.

★ ★ ★

Mr. Mansure said this is 40 per cent more than the amount required under existing contracts the Government has with the major aluminum producers.

★ ★ ★

"Under the contracts," Mr. Mansure said, "a minimum of two-thirds of all aluminum produced by new facilities, less purchases for the National Stockpile and set-asides for the Atomic Energy Commission and the Department of Defense must be made available to non-integrated users. The new facilities are those covered by expansion contracts between the Government and the aluminum industry."

★ ★ ★

Contracts with the three major producers—Aluminum Company of America, Reynolds Metals Company and Kaiser Aluminum & Chemical Corporation — require that they offer two-thirds of their new production less U. S. Government needs, to non-integrated users of aluminum for a period of five years from the date expansion started. For the next fifteen year period, 25 per cent of expanded production will be offered to non-integrateds.

★ ★ ★

The 101 million pounds announced today has already been contracted for.

★ ★ ★

Total production for the fourth quarter will be about 651,000,000 pounds. Of this amount, approxi-

NARCO METAL BOUND REELS **provide 300% more service. Exhaustive tests have shown a 24" all-wood reel will average four trips—*with repairs*. A NARCO METAL BOUND REEL of the same size will average 12 to 16 trips *with no repairs*. All for only approximately 50% more cost.**

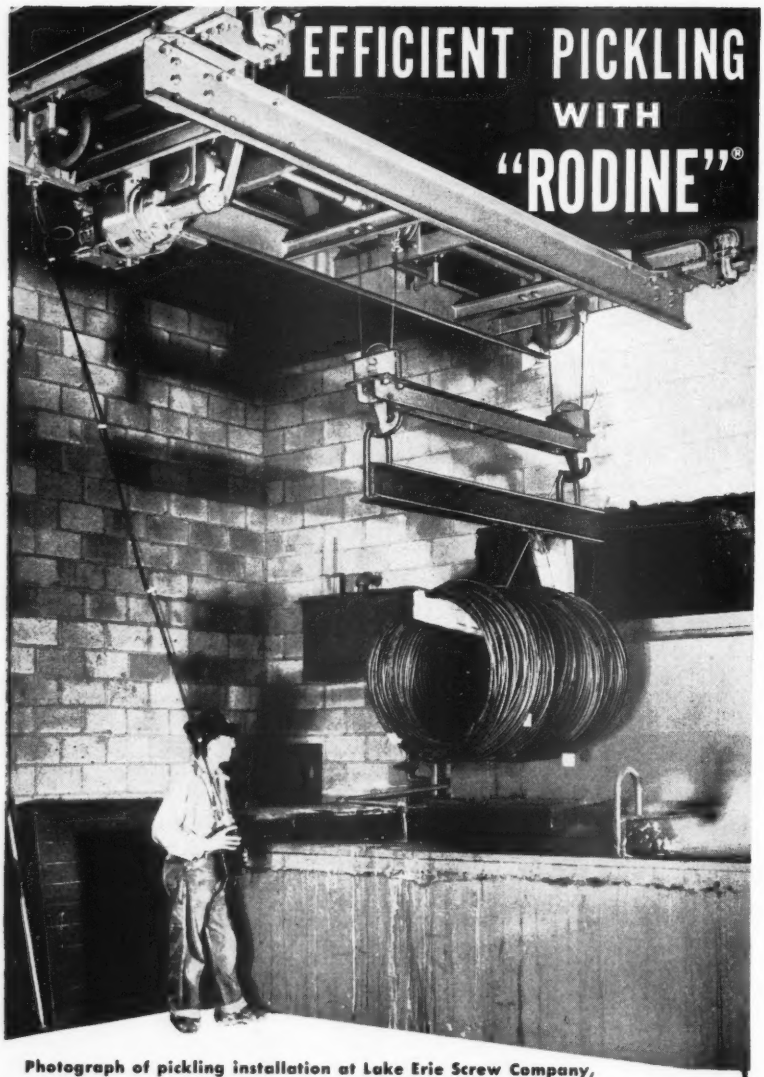
NARCO METAL BOUND REELS **are made in 12" to 48" diameters. All-wood reels from 12" in diameter to any size required.**

All reels shipped assembled or knocked down for assembly to wood or steel drums.

Further information or quotations promptly furnished.

North Anson Reel Co.

TELEPHONE MADISON 187-2 NORTH ANSON, MAINE



Photograph of pickling installation at Lake Erie Screw Company, by courtesy of The American Monorail Company, Cleveland, Ohio.

Rod and wire are pickled clean in "Rodine"-inhibited acid without waste of either acid or metal. Breakage in drawing, from acid brittleness, is minimized.

Wire and rod, pickled with "Rodine", as compared with less effective inhibition, are larger in diameter, and when drawn to the finished gauge the coils are longer and correspondingly heavier.

"Rodine" more than pays for itself in savings of acid and metal.

AMERICAN CHEMICAL PAINT COMPANY

CHEMICALS ACP PROCESSES

General Offices:

AMBLER, PENNSYLVANIA

Detroit, Mich. ***Niles, Calif.*** ***Windsor, Ont.***

mately 231,000,000 pounds will result from new production.

★ ★ ★

During the third quarter of 1953, fabricators had available 90,000,000 pounds. Production from new facilities for that period was approximately 220,000,000 pounds, and total production totaled 650,000,000 pounds.

★ ★ ★

When all plants involved in the present aluminum expansion program are completed, annual production will be well over 3 billion pounds.

New Marginal Copper Contract

A contract designed to yield 3,000,000 pounds of refined copper for delivery to the Government has been signed with the Riviera Mines Company of Phoenix, Arizona, it announced recently by **Edmund F. Mansure,** Administrator of General Services.

★ ★ ★

The agreement provides that the company will produce ore from its "high cost" Christmas Mine, located in the Banner Mining District, Gila County, Arizona. The Company will arrange with a qualified smelter to process the ore.

★ ★ ★

The Government will pay 32 cents per pound Connecticut Valley, less a differential of 0.3 cents per pound for all deliveries made common carrier's conveyance, Perth Amboy, N. J.

★ ★ ★

Terms of the agreement call for production of 600,000 pounds in calendar year 1953 and 1,200,000 pounds annually in 1954 and 1955. The agreement automatically ends December 31, 1955 or earlier if the full production has been achieved.

★ ★ ★

On March 14, 1952, the Government signed an agreement with Sam Knight Mining Lease, Inc., for production from the same mine of up to 2,390,000 pounds of prime lake copper which, due to high cost factors, was to be supported at a price of 31.6 cents per pound.

★ ★ ★

That agreement terminated automatically when copper was removed from price controls on February 25, 1953. At that time over 1,150,000 pounds had been produced.

★ ★ ★

A determination on the part of the Government that it is necessary to insure the continued production of copper for defense needs resulted in the current contract.

ABSTRACTS

AN X-RAY CAMERA FOR MEASURING PREFERRED ORIENTATION IN WIRES.

A. L. Mackay (Birkbeck Coll Res Lab, London). Journ Sci Instr 1953 Vol 30 (7) pp 244-245 (July)

Special camera constructed for examination of crystallite orientation in superficial wire layers and at depths below surface by etching down dia. Collimated x-ray beam is arranged to pass along axis of cylindrical film cassette. Wire specimen under examination crosses beam at right angles, running right through camera and moved by motor so that 3 cm length is scanned. Cones of diffracted rays from specimen recorded on film as straight lines, indexed by inspection or reading theta-values from chart. Reflexions with Bragg angles of 12 to 75 deg registered. Camera incorporates advantages of flat plate camera in giving complete rings on film; includes reflexions up to high theta-values only reached with cylindrical camera, and permits estimates of strain or grain size simultaneously with orientation determination. 4 illustr, 3 ref.

★ ★ ★

AMERICAN USE OF WIRE AND SHEET GAUGES.

Anon. Wire Ind 1953 Vol 20 (235) p 691 (July)

Four standard gauges commonly used in USA. Steel sheets, plates and sheet nickel designated according to gauge roughly similar to SWG dimensions over full range of gauge numbers from 7/0 (0.5 in.) to 38 (0.00625 in.); gauge does not accommodate thicknesses under this or over 0.5 in. Several thicknesses appropriate to various gauge numbers reduce to simple fractions, eg 5/0 gauge = 7/16 in. Washburn and Moen gauge, also similar to SWG, is essentially wire gauge, maintaining equivalent dia values to SWG up to No. 26. Brown & Sharpe gauge standard for aluminum other than tubing, brass sheet, strip and wire, and copper sheet and wire; differs from SWG sizes except around gauge No. 0. Lesser known and used gauges not described.

★ ★ ★

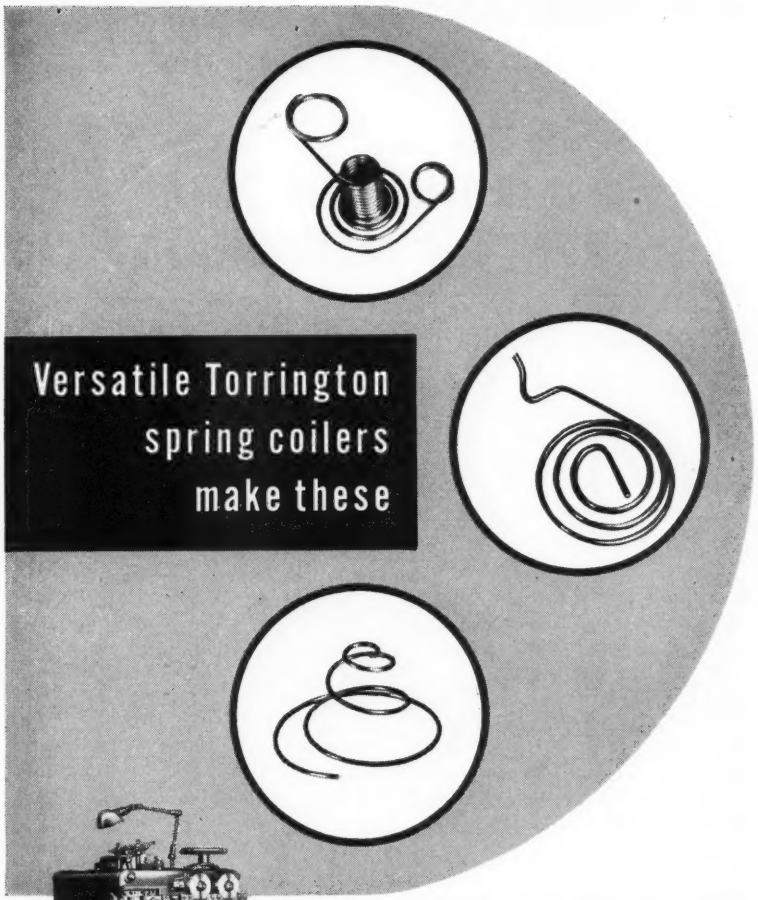
ON THE TEMPERATURE EFFECT OF AL WIRE DRAWING.

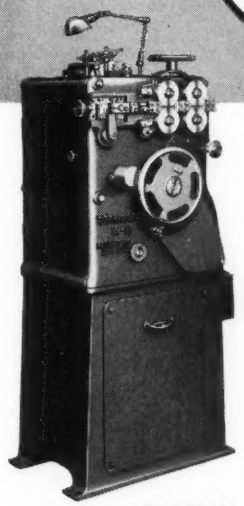
A. Yamamoto, Japan Soc Mech Engs 1952 Vol 18 (65) p 162 (In Japanese).

HEAVY-DUTY DIE LAPPING.

Anon. Ind Diamond Rev 1953 Vol 13 (152) pp 158-162 (July)

Description of operation of British





Model W-11, one of fourteen versatile Torrington Spring Coilers

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive

Torsion and other attachments available.

PLUS an amazing range of other intricate springs that meet the most exacting requirements. Professional springmakers from coast to coast agree that a Torrington Spring Coiler can't be beat for speed, accuracy and economy. Your professional springmaker who owns a Torrington spring coiler can make springs to your special needs. If you're uncertain about a source of supply for a special spring you want, our sales department will help you find it or help your springmaker devise tooling to produce it.

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: IMPROVED DRAWING AND COLD FORMING WITH GRANODRAW

INTRODUCTION:

When steel is phosphate coated with "Granodraw" prior to working it, drawing, extrusion, and other cold forming operations are greatly improved. In fact, the protective phosphate coating makes the cold extrusion of steel possible.

Getting cold steel to flow depends on the unique properties of this coating. Its non-metallic phosphate crystals are physically and chemically adapted to acquire a strongly adsorbed lubricant. The combination of adherent phosphate coating and adsorbed lubricating film possesses a low coefficient of friction while maintaining its integrity under extremely high deforming pressures.

The drawing of wire and many other cold forming operations — including the cold extrusion of steel — are greatly facilitated by the application of a "Granodraw" phosphate coating and a suitable lubricant prior to working.

"GRANODRAW" DATA

"Granodraw" zinc phosphate coating chemical is applied to pickled surfaces in an immersion or spray process. When used with a suitable lubricant, the coating reduces friction under conditions of low, medium, or high deforming forces encountered in such typical operations as: cold extrusion of steel; cold shaping; deep drawing (tubs, cartridge cases, shells, etc.); stamping; drawing of wire and tubing; ironing; necking; nosing; and upsetting.

ADVANTAGES OF PHOSPHATE COATING WITH "GRANODRAW" PRIOR TO COLD FORMING STEEL

The following are among the advantages indicated for phosphate coating with "Granodraw" prior to cold forming steel:

Drawing of wire, bars, tubing, etc. — Improved lubrication; improved surface; less scratching; reduced pull; greater percent reduction per pass; reduced die wear; longer die life; lower die maintenance and cost; reduction in corrosion.

Drawing of stampings, shells, shell cases, etc. — Improved lubrication; reduced breakage; reduction in scrap; deeper draws; less scratching; elimination of some annealing; less wear on dies.

Cold Extrusion — Improved lubrication; increased strength of parts; improved surface; reduction in load on press; greater dimensional accuracy; more uniform wall thickness; longer extrusions; elimination of some annealing; less corrosion.

CHEMICALS ACP PROCESSES **WRITE FOR FURTHER INFORMATION ON "GRANODRAW" AND ON YOUR OWN METAL PROTECTION PROBLEMS.** CHEMICALS ACP PROCESSES

heavy-duty vertical die lapping machine taking dies up to 5 in. dia. 1 illustr.

★ ★ ★

MEASUREMENT OF THE BEARING LENGTH OF DRAWING DIES.
Anon. Ind Diamond Rev 1953 Vol 13 (152) pp 158-162 (July)

Following a suggestion by P. Grodzinski in 1945 in Germany a number of measuring instruments for determining the bearing length of diamond and sintered carbide drawing dies has been developed making use of one or two conical needles. Use instruments is discussed in detail and further the influence of rounded edges and conical bearings is evaluated. 9 illustr, 3 ref, 1 table.

★ ★ ★

PRECISION [DIE] LAP GRINDER.
Anon. Ind Diamond Rev 1953 Vol 13 (153) p 189 (Aug)

New precision grinding machine developed in England, taking round and shaped laps up to ¾ in. dia. Operation of machine described. 1 illustr.

★ ★ ★

WIRE ROUNDNESS TESTER.
Anon. Ind Diamond Rev 1953 Vol 13 (152) p 162 (July)

Description of new German fine-wire roundness tester comprising a microscope, eyepiece, screw-micrometer and measuring cylinder. 1 illustr.

★ ★ ★

PRODUCTION OF FINE TUNGSTEN AND MOLYBDENUM WIRE.
Anon. Instrument Practice 1953 Vol 7 (6) pp 429-430 (Apr); Ind Diamond Rev 1953 Vol 13 (152) p 166 (July)

A new technical film 'It's a good sign' has been produced by Mullard Ltd showing the production of fine tungsten molybdenum wires some of less than 8 micron dia.

Editor Note: These Abstracts are published through the courtesy of the Industrial Diamond Information Bureau, 32-34 Holborn Viaduct, London E.C. 1, England. Inquiries regarding them should be directed to the Bureau.

Standards for Rubber Insulated Tree Wire Revised

The American Standards Association, 70 East 45th St., New York 17, N. Y., has issued revised specifications on this type of wire. Copies are now available at a cost of 50c each. Ask for specification C8.16-1953.

★ ★ ★

The standard, published in its original form in 1942, is designed to reduce repair and renewal of electric wires as a result of wear and rubbing-against-tree-branches.

★ ★ ★

The wire specified in this standard is used in areas where electric wires must be run through trees.

The use of this tree wire helps to eliminate the unsightly dangling of wire wrappings.

* * *

Committee C8, who developed the standard, had primarily in mind the prevention of interruptions of electric power service.

* * *

The committee is composed of representatives of sixteen national organizations interested in improving quality and serviceability of wire and cable. They are the American Society for Testing Materials, American Institute of Electrical Engineers, Anaconda Wire and Cable Company, Armed Services Electro Standards Agency, Association of American Railroads, Association of Iron and Steel Engineers, ASA Electric Light and Power Group, Insulated Power Cable Engineers Association, International Municipal Signal Association, National Board of Fire Underwriters, National Bureau of Standards, National Electrical Manufacturers Association, National Fire Protection Association, ASA Telephone Group, U. S. Department of the Army, U. S. Department of the Navy.

ASA Announces New Magnet Wire Standards

Four new American Standards for magnet wire have just been published by the **American Standards Association,** it has been announced by **Vice Admiral George F. Hussey, Jr.,** managing director.

* * *

The new standards were developed by Sectional Committee C9 under the sponsorship of the National Electrical Manufacturers Association. These American Standard specifications, also bearing a NEMA designation, are for enameled-coated, cotton-covered, silk-covered and nylon fibre-covered round copper magnet wire. The nylon fibre-covered wire is new.

* * *

The first three of these American Standards replace others issued some years ago (C8.5, C8.6, C8.7 and C8.20). The new standards include tables of maximum

The Recognized Symbol of Quality

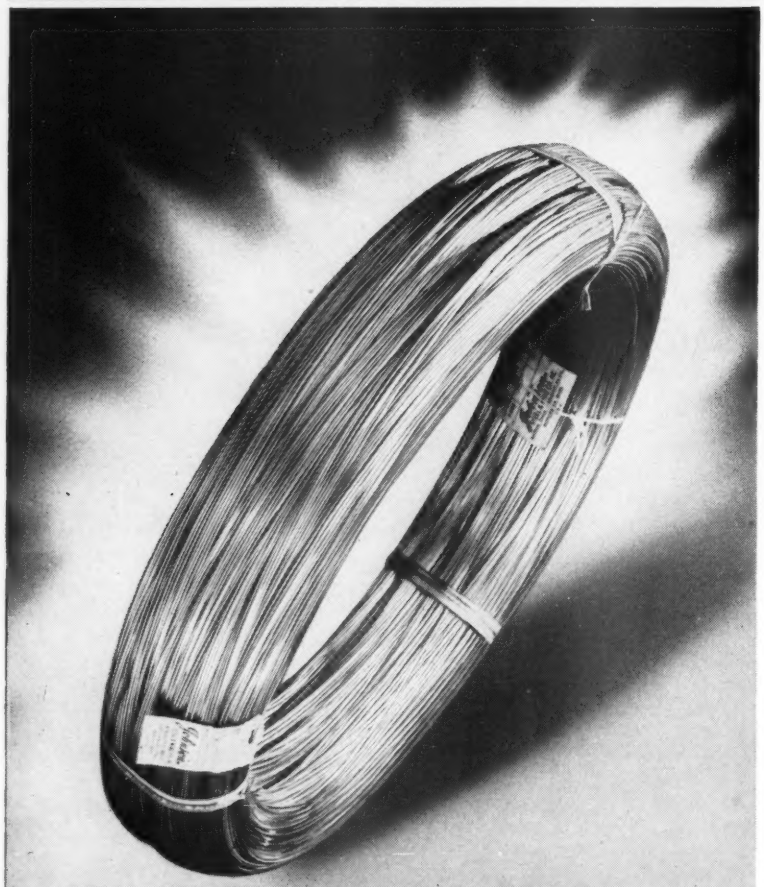
The structural soundness and uniformity of Keystone "Special Processed" Cold Heading Wire is attained by careful selection of raw materials, our own exclusive drawing and heat treating process, rigid quality controls and inspections under the vigilant direction of Keystone's metallurgical staff.

The excellent flow properties of this wire assures the desired upsetting and die forming characteristics required for efficient cold heading; longer die life; increased production; and a higher quality finished product.

Compare the performance of Keystone "Special Processed" Cold Heading Wire next time you have an unusually difficult cold heading problem to solve.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS



High Quality High Carbon Wires

Life is like that. You usually hear about the man who hit the jackpot, but the fellows who built it up are unknown.

The success of Johnson Music Wire is not due entirely to our scientists who exercise authority over every process in manufacturing, to our skilled wire drawers, to our steel treaters, to our testing force, or the supervisory wire men, but to our well-knit organization—each member with an important function to perform all the way from rod to the carefully wrapped coils. These are the men who build up the jackpot that our customers hit.

JOHNSON

JOHNSON STEEL AND WIRE COMPANY, INC.

WORCESTER 1, MASS.

New York Philadelphia Cleveland Detroit Akron Chicago
Atlanta Houston Tulsa Los Angeles Toronto

A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

overall diameters, scrape tests and tests for softness.

★ ★ ★

Magnet wire is used in great quantities in the windings of motors, transformers, control equipment and in coils for electronic, radio and communications equipment. Therefore, a uniform arrangement has been followed in each of the four standards, so that a user, becoming familiar with one standard, can readily find the corresponding provision in the others.

★ ★ ★

Copies of these standards may be purchased from the Association at 70 East 45th St., New York 17, N. Y.

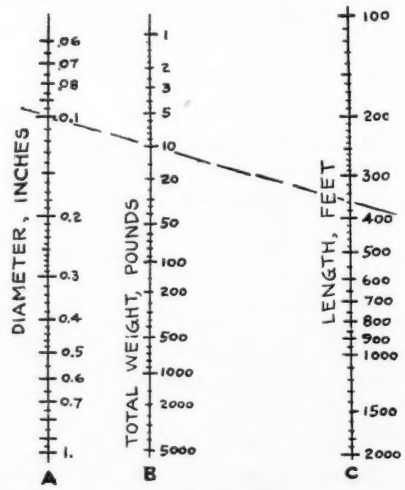
Weight of Steel Wire

by W. F. Schaphorst, M.E.
Newark, N. J.

Handy Chart Gives the Weight over a Wide Range of Diameters and Lengths.

★ ★ ★

Let us say that you want to know the weight of 360 feet of steel wire that is 0.1 inch in diameter. Simply run a straight line through the 360 in column C and the 0.1 in column A as shown by the dotted line drawn across this chart. It cuts column B at a point a trifle less that 10. In other words, column B tells us that the weight



of the wire is almost 10 pounds. That's all there is to it.

★ ★ ★

Now let us suppose that the wire is only 36 feet long instead of 360 feet. In that event the weight would be one pound instead of ten pounds. You simply move the decimal point one place to the left in 10 and we have 1.0 or, one pound.

★ ★ ★

Where the length of the wire is 3.6 feet, move the decimal point one more place to the left and the weight becomes 0.1 pound, or, one-tenth of a pound. And so on.

★ ★ ★

Since column A varies all the way from 0.06 inch to one inch in diameter, and column C varies from 100 ft. to 2,000 ft., it is obvious that the chart, as is, will take care of almost any combination of diameters and lengths

★ ★ ★

However, let us say that the diameter of the wire is one-hundredth of an inch, and the length 360 feet. Use the same dotted line drawn across this chart and move the decimal point **two** places to the left this time, which gives us 0.1 pound as the weight. Or, if the diameter is one-hundredth of an inch the weight of 360 feet becomes 0.001 pound, or, one-thousandth of a pound.

★ ★ ★

When you alter a figure in column A by one decimal point you alter the answer by two decimal points. Why? Because the weight of a wire is proportional to the square of the diameter.

★ ★ ★

Experiment with the chart for a few minutes and you will find it to be a great time saver.

★ ★ ★

If the wire is aluminum, brass, copper, gold, silver, or anything else, you can quickly convert by using the conversion factors that are given in handbooks.

Laclede Installs New Power Plant

Conversion from steam to electric power for the blooming mill of **Laclede Steel Company's** Alton

3 ways *Solar* solves a sales problem... IN YOUR FAVOR

...with SOLDURA GRAY WIRE COLOR SOLUTION

1 GREATER SALES APPEAL!

Gray Soldura gives the buyer visible evidence that the flame-proof compound on non-metallic sheathed cable and service entrance cable is completely sealed and covered. Moreover, it camouflages service entrance cable used on white houses and forms an excellent base for the subsequent application of house paint.

2 STAYS CLEANER!

Gray Soldura *looks* cleaner because it *is* cleaner. It's used with a clear wax top dressing (which makes it easier to pull through joists or fish through conduits) and will not mark up walls during installation. Workmen's hands stay cleaner, too.

3 PROTECTS against STICKING!

Actual laboratory tests have shown that gray Soldura, applied with a proper saturant and finish, will prevent sticking at temperatures as high as 140°F. and will not flake off under freezing conditions.

FOR GREATER SALES APPEAL... FOR CLEANER APPEARANCE, EASIER HANDLING, AND FREEDOM FROM STICKING OR FLAKING... USE SOLDURA... THE GRAY WIRE COLOR SOLUTION THAT BUILDS SALES.

SPECIFICATIONS*

Weight per gallon	15-16 lbs.
Total solids	75-80%
Viscosity, Gardner Mobilometer @ 77°F., 250 grams load	15-20 seconds
Estimated coverage—Sq. Ft. per gal.	1250-1500
Number of coats recommended	Two, for best results
Colors	Light, medium and dark gray

**Gray Soldura is soluble in alcohol, acetone, and common lacquer solvents, but is not soluble in gasoline and petroleum solvents.*

FOR SPECIFIC INFORMATION ABOUT GRAY SOLDURA MS-551 AND A COMPLETE REPORT ON OUR LABORATORY TEMPERATURE TESTS, WRITE TO SOLAR COMPOUNDS CORPORATION.

Solar Compounds Corporation
Solar Varnish Corporation
The Originator of Wire Color Solutions
1213 WEST BLANCKE STREET • LINDEN, N. J.

STRETCH YOUR REEL DOLLAR
NORTH ANSON REEL CO.
THE DOLLARS YOU SPEND ON REELS GET THE MOST WHEN YOU BUY NARCO METAL BOUND REELS
Narco Metal Bound reels last three to four times as long as all wood reels. A 36" Narco Metal Bound reel will make four trips for every one trip obtained from a 36" all wood reel. Narco Metal Bound reels require no repairs. The initial cost is the only cost of the reel. Substitution of 36" Narco Metal Bound reels for 36" all wood reels reduced the cost per trip of this diameter reel for one company from $2.91 to $.80.
Further information or quotation furnished on request.
North Anson Reel Co.
NORTH ANSON, MAINE TELEPHONES: MADISON 6-3171 6-4471 6-3367

(Ill.) Works has been completed. Three years of planning and construction were climaxed with a change-over requiring only 72 hours.

★ ★ ★

A new 5,000 H.P. reversing drive motor built by Westinghouse replaced the 60 year old steam engine which had first operated in the Cumberland Gap and had been featured in the famous novel "The Trail of the Lonesome Pine," by John Fox, Jr. Discarded when the Cumberland steel boom collapsed, the old twin cylinder engine was later rescued and for 40 years has been the noisy, earth jarring heart of the Alton Works.

★ ★ ★

The new motor and attendant generator set are sheltered in a three-story structure. They are protected by a 140,000 C.F.M. precipitron which assures a continuous flow of cool, dust-free air at the rate of 200,000 cubic feet per minute.

★ ★ ★

Only three seconds is required for the huge motor to change from full speed forward to full speed reverse. A flywheel on the generator weighs 48 tons. It is so well balanced that, on an early test, it continued to run for seven and a half hours after the power was turned off.

★ ★ ★

Laclede's Alton plant is a completely integrated steel mill operating from raw materials to a wide variety of products. Not many miles away, at Madison, Ill., Laclede has the largest rail re-rolling plant in the world. Among the products of this plant, largely devoted to products for the construction industry, are Laclede's electric welded steel joists, of which more are used from this company than any other in the United States.

★ ★ ★

Founded in 1911 by **T. R. Akin,** the company now has his son, **William M. Akin,** as president. A grandson, **Paul,** is employed at the Alton Works.

★ ★ ★

Outstanding Personalities of the Wire Industry

Naugatuck Chemical Moves Bruce to Akron

Lawrence H. Bruce, technical representative for the latex and aqueous dispersions group of the Naugatuck chemical division, **United States Rubber Company,** has been assigned to Akron, Ohio, it was announced recently by **Albert Holmberg,** sales manager of latices and aqueous dispersions.

★ ★ ★

Mr. Bruce, who has been assistant technical sales representative in the New York and New Jersey area, is a graduate of Northeastern University, Boston, Mass. He has been associated with Naugatuck chemical for approximately 11 years. Previous posts he has held include senior chemical engineer, foreman of Lotol plant, head of process engineering, chemist in latex laboratories, and assistant to the sales manager.

In his new post he will make his headquarters at 247 East Exchange Street, Akron. His territory will include Ohio, Western Pennsylvania, part of Indiana, West Virginia and the eastern part of Kentucky.

Heil Appoints District Salesman

The appointment of **Richard F. Protiva,** as District Sales Engineer, has been announced by **E. W. Vereeke,** General Sales Manager of **Heil Process Equipment Corp.,** 12901 Elmwood Avenue, Cleveland 11, Ohio.

★ ★ ★

Mr. Protiva received his Metallurgical Engineering Degree from Case Institute of Technology, and has had approximately thirteen years' experience in the sale and service of chemical process equipment in this territory.

★ ★ ★

He will be responsible for all sales in the eastern portion of the home territory, in which he will handle **Heil's** corrosion-proof line of chemical-proof tanks, tank linings, heat exchanger equipment, lead anodes, steam jet agitators, and plastic exhaust hoods and duct work to the Chemical, Steel and Electroplating Industries.

Allan Dove Moved to Hamilton

Allan B. Dove, formerly Works Manager of the Dominion Works of the **Steel Company of Canada, Ltd.,** at Lachine, Quebec, has been moved to the Canada Works at Hamilton, Ontario, where he is presently engaged in his new duties as Plant Superintendent. Mr. Dove is well and widely known to the wire fraternity and is always a familiar figure at Wire Association Conventions, of which society he has been a director for many years.

Glader-Years of Proven Performance
GLADER NAIL MACHINES
55 YEARS of experience meeting the exacting demands of nail making.
The machine with a record of steady dependable service.
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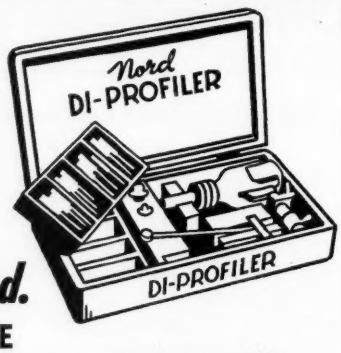
Di-Profiler
TRADEMARK

50 TIMES FASTER

than die-filing by the old hand method.



A NEW TOOL FOR CARBIDE DIE CUTTING AND REPAIRING, THE Di-Profiler
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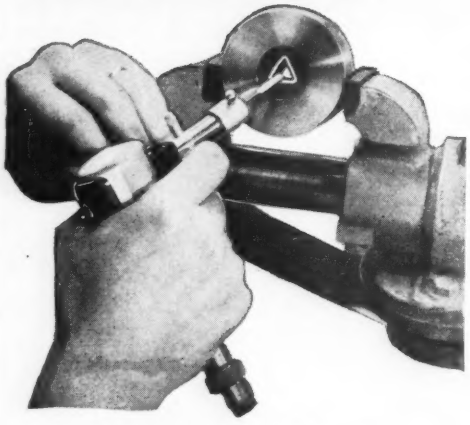


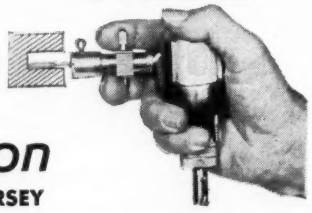
This tool is light, portable and fast-cutting. Comes equipped with a set of diamond files and hones that can cut, lap and polish at unprecedented speeds—the tools are operated at 28,000 strokes per minute.

Good for round dies, but especially efficient and fast on shaped dies, doing a job that normally takes hours, in a matter of minutes.

This remarkable new tool, of which hundreds are in daily use, is inexpensive to buy, easy to use and produces excellent results at great savings of time and money.

Has hundreds of other uses and will be found an invaluable aid in mill maintenance repair shop work. A 50 page hand book of applications goes with each NORD DI-PROFILER.

Write for full details and ask for a demonstration.



Nord International Corporation

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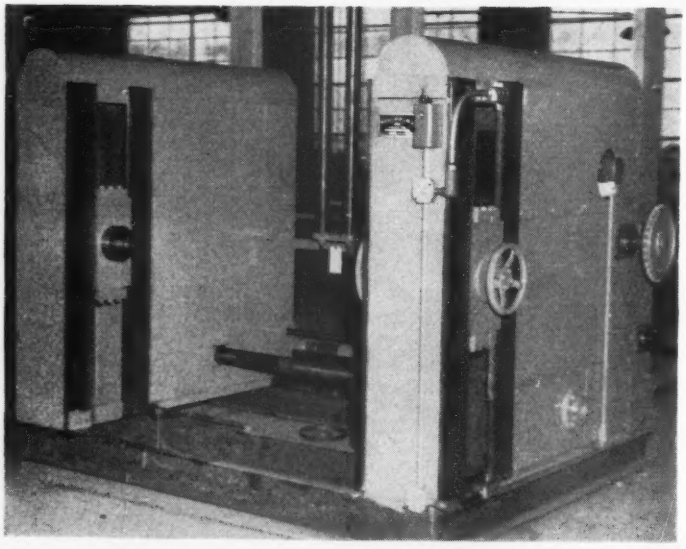

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THE LARSON COMPANY, TORONTO, CANADA

Appointed Assistant Works Manager by Pittsburgh Steel

Appointment of **Donald C. Duvall** to the newly created position of assistant works manager, Monessen Plant, was announced recently by Pittsburgh Steel Company. Mr. Duvall was formerly chief industrial engineer of the Monessen and Allenport, Pa. plants.

★ ★ ★

John Miller has been appointed to succeed Mr. Duvall in the position of chief industrial engineer. He was formerly assistant chief industrial engineer.

★ ★ ★

Announcement was also made of the appointment of **Alexander A. McVicker** to the newly created position of superintendent of maintenance, Monessen plant. He was formerly coordinator of maintenance.

★ ★ ★

Mr. Duvall was born in Monessen and attended public schools there before attending Pennsylvania State College, California State Teachers College and the University of Pittsburgh, where he graduated with a B.S. degree. He joined the industrial engineering department at Monessen in 1941, and advanced from the time study engineer to assigned engineer, to plant industrial engineer in Allenport, and in 1949 became chief industrial engineer.

★ ★ ★

Mr. Miller was graduated from Washington and Jefferson College and joined Pittsburgh Steel in 1941 as a time study engineer at the Monessen plant. He advanced through the positions of time study engineer, assigned engineer and assistant chief industrial engineer to his new post.

★ ★ ★

Mr. McVicker has been with Pittsburgh Steel since 1928 in the engineering department as a field engineer. Since 1950, he has been coordinator of maintenance.

Advanced by Sheet and Tube

Walter J. Prochak has been appointed assistant superintendent of the Cold Drawn Bar Department at Brier Hill works of **The Youngstown Sheet and Tube Company.**

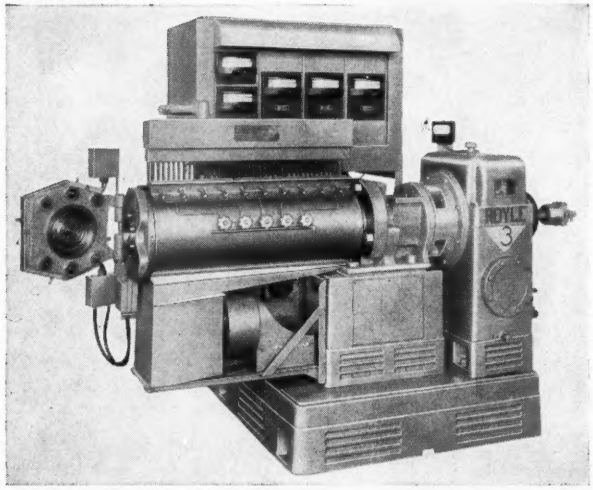
★ ★ ★

Mr. Prochak, a native of Youngstown, attended public schools in nearby Struthers, went to Ohio State University and to Youngstown College. He supplemented this with night school and correspondence courses in metallurgy, maintenance engineering and economics.

★ ★ ★

On March 17, 1937, he joined the company as a tester in the metallurgical department. Three years later he became a metallographer; was appointed assistant metallurgist at the company's Rod and Wire plant at Struthers in 1947 and the following year was named metallurgist at the Brier Hill Works.

FASTEST HEATING FASTEST COOLING



Here are some of the time-tested, money-saving reasons more and more plants are standardizing with Royle Spirod* Extruders for processes requiring maximum flexibility in controlled temperatures — constantly maintained and accurately zoned:

- **Extra heavy walled cast steel cylinders that will not warp. No joints to leak when pressures are high or crevices to collect burned compound that would cause contamination.**
- **Heavy duty large diameter heating elements, that can be used with 440 volts without step-down transformers, provide radiant heat to cylinders and heads.**
- **Any heating element may be removed and replaced without disturbing other elements or wiring.**
- **A cooling system with ten times the capacity of conventional designs can be modulated through its entire temperature range without drastic changes. Ample cooling for all compounds at maximum speeds.**

No. 3 Royle Spirod Extruder. Completely insulated and equipped for evaporative cooling.

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PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

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PATERSON 3, NEW JERSEY

Torrington Company Announces Staff Changes

Walter C. Thompson, formerly vice president-sales, was elected executive vice president of the **Torrington Company,** Torrington, Conn., to succeed **Alfred W. Burg,** retired after 37 years with the company. **Ray B. Nichols,** formerly president and general manager of Torrington Company of Indiana, a subsidiary, was made vice president in charge of sales succeeding Mr. Thompson. He will have headquarters at Torrington and also continue as president of the Indiana company, where **Rodney T. Dunlap** becomes vice president and general manager. Other promotions at the South Bend plant include **John A. Toth** as assistant general manager and **Walter Fisher** as chief engineer.

Appointed by Townsend Company

Fred J. Schreiber, Jr., has been appointed director of commercial research by the **Townsend Company** of New Brighton, Pa. He was formerly with the National Tube Division of U. S. Steel Corporation in the same capacity.

NRM EXTRUDERS

Give you

FASTER, BETTER WIRE COVERING

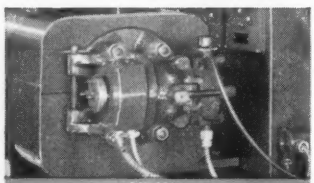
That's right!! NRM extruders have many features designed to give you faster, better covering of wire with plastics.

Take, for instance, NRM's die and front flange assembly—an exclusive feature—engineered to save you time, money, and effort—designed to give you better extrusions through exacting heat control.

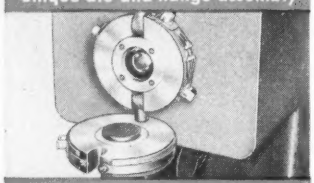
Simple and sturdy . . . this assembly swings open quickly — dismantles easily — permits faster die and screen changes and easier "change-overs" from one plastic to another.

Furthermore . . . both the die gate adapter and the flange carry exterior band heaters which eliminate critical heat losses and give more uniform extrusions. For Nylon extrusions, the flange can be completely removed and the Nylon die or crosshead, with heaters, mounted directly on the cylinder face. Such a mounting also permits controlled heating and exact extrusions.

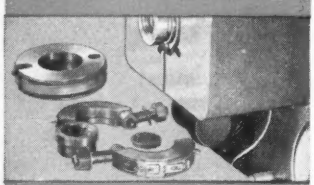
NRM's unique die assembly is now available on its 1½", 2½" and 3½" electrically heated plastics extruders. Write, today, for more information on this and all the features of NRM extruders.



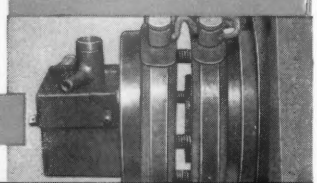
NRM's unique die and flange assembly



for faster die or screen changes



for easier "change-overs"



for more uniform extrusions

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Creative Engineering

John W. Sheperdson

John W. Sheperdson, 74, who retired as executive vice president of Morgan Construction Company January 1, 1952, died on September 30th at his home, 15 Burgess Road.

He had lived in Worcester and served with the company since January 1, 1916. In 1926, he was elected to the board of directors and in 1929 became vice president. He served in a consulting capacity to the directors after his retirement.

★ ★ ★

John W. Sheperdson ★ ★ ★ ★ ★

Mr. Sheperdson was born in St. Petersburg, now Leningrad, Russia, son of the late William T. and Margaret (Parry) Sheperdson. His parents were British subjects living in St. Petersburg.

★ ★ ★

He came to the United States in 1901 and took employment with the Mahoning Valley Railway Co., Youngstown, Ohio. In 1905, he joined the engineering staff of William Tod Co., engine builders, in Youngstown.

★ ★ ★

Mr. Sheperdson became associated with the Cambria Steel Co. in Johnstown, Pa., in 1907 as a steam engineer. The company is now a subsidiary of the Bethlehem Steel Co. In 1911, he was promoted to superintendent of Gauthier Works Division of the company.

★ ★ ★

From 1914 to 1916, when he came to Worcester, Mr. Sheperdson was assistant general superintendent and chief engineer of the

Central Iron & Steel Co., makers of plates, in Harrisburg, Pa.

★ ★ ★

He became a United States citizen in 1920 in Superior Court, Fitchburg.

Westinghouse Northeastern Region Reorganized

The Northeastern Region of the **Westinghouse Electric Corporation** has been re-organized to include five sales districts, Robin S. Kersh, region vice president, announced recently. They are the Boston, Connecticut Valley, Newark, New York City and New York State Districts.

★ ★ ★

E. C. Delano was named manager of the Boston District, with headquarters at Boston, Mass.; branch offices at Augusta, Me., and Providence, R. I.; and a sales office at Worcester, Mass.

★ ★ ★

E. G. Horton was appointed manager of the Connecticut Valley District, headquartered at Hartford, Conn.; with branch offices at New Haven, Conn., and Springfield, Mass., and sales offices at Bridgeport, Conn., and Rutland, Vt.

★ ★ ★

W. C. Wood was named manager of the Newark District, with headquarters at Newark, N. J., and a sales office at Trenton, N. J.

★ ★ ★

H. E. Dralle was appointed manager of the New York City District, with headquarters at 40 Wall Street, New York City.

★ ★ ★

H. B. Vidal was named manager of the New York State District, with headquarters in Buffalo, N. Y. A branch office will be located at Syracuse, with sales offices at Albany, Johnson City, Rochester, Utica, Niagara Falls, Olean and Watertown.

Named Manager of Wire Unit by Michigan Oven

Michigan Oven Company, 415 Brainard St., Detroit 1, Mich., designers and builders of ovens for industrial heating and processing, has announced the appointment of **C. A. Windsor** as manager of the company's wire equipment division.

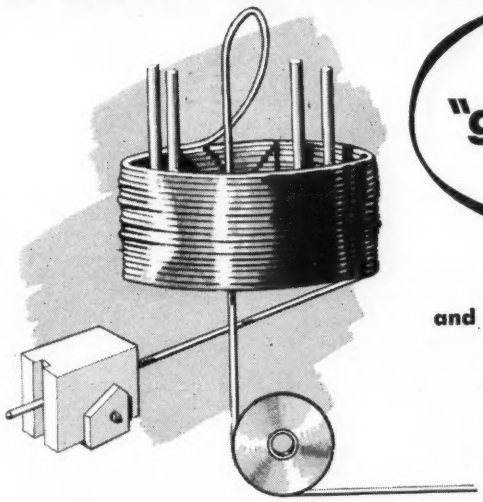
★ ★ ★

For 20 years, Mr. Windsor has been connected with insulated wire and industrial heating engineering —five with the Belden Manufacturing Company and the last seven with Western Electric Company in wire enameling. Previously, he had served a year and a half with Bendix Aviation Corporation and eight years with General Electric Company.

Dugall Transferred to California by Kaiser

J. T. Dugall has been moved to Oakland, Calif., to assume duties in the newly created position of rod, bar and wire operations manager for **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif., and **C. W. Heppenstall** was made plant manager of the corporation's rod, bar and wire works at Newark, Ohio in his stead. Mr. Dugall, formerly Newark plant manager, has been with Kaiser Aluminum since 1949.

DURPON* **DRAWING COMPOUNDS**



don't "get tired" easily

Initial performance is high, and they keep it twice as long!

Many soap lubricants for wire-drawing non-ferrous metals work well enough "the first time around." How well they perform when recirculated is another matter—which has a strong influence on the life of your expensive dies.

It's no accident that Nopco Durpon Drawing Compounds have double the effective life of ordinary drawing compounds. They are designed to have just that. A special additive prevents contamination of the effective drawing ingredients by dirt and by metallic particles . . . maintains the normal balance between soap and lubricant during re-circulation.

You gain two important economies from this lengthened stability. Nopco Durpon Drawing Compounds last longer . . . so do your dies.

All three types, Durpon, Durpon L and Durpon FW are natural lubricants; all are on the alkaline side (pH 8.0 to 10.5). Write today for technical bulletins and testing samples.

"stay stable longer"
DURPON for intermediate wire
DURPON L for rods, tubes, and heavy wire
DURPON FW for fine wire

*Reg. U. S. Pat. Off.

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CHEMICAL COMPANY, Harrison, N. J.
BOSTON • CHICAGO • CEDARTOWN, GA. • RICHMOND, CAL.

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Greater service from a new **ALL WELDED STEEL TAKE OFF REEL** designed to meet present day requirements.

Usual maintenance expense eliminated by adoption of this new design wherein all parts are welded into one homogeneous unit.

Reel sides are embossed with radial reinforcing ribs for increased rigidity with rolled edges for additional strength and to facilitate handling.

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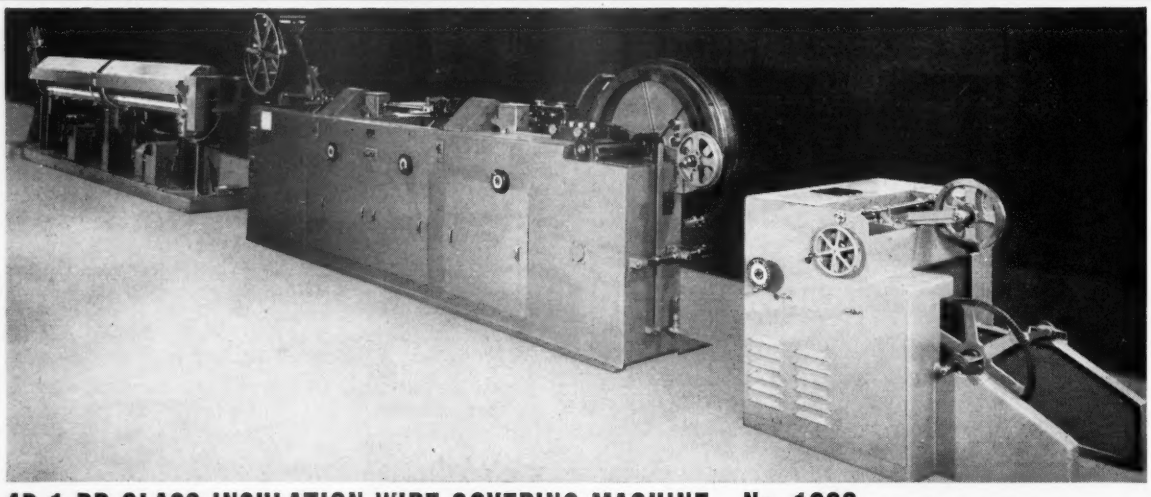

4D-1-BB GLASS INSULATION WIRE COVERING MACHINE **No. 1088** Patented Aug. 3, 1943

WITH VARIABLE SPEED DRIVE.
TORQUE MOTOR DRIVEN TAKE-UP REEL STAND
BALL AND ROLLER BEARING MOUNTED
BAKING OVEN WITH DOUBLE VARNISH APPLICATOR
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Wire Drawing, Enameling, Tinning, Insulating,
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Wire Man Decorated by Swedish King

John A. Berg, president of **New England High Carbon Wire Co.,** was decorated with the Knights of the Royal Order of Vasa medal from King Gustaf Adolf VI of Sweden at the 30th anniversary "jubilee family party" recently at the plant on Howe Avenue, Millbury, Mass.

★ ★ ★

The presentation was made by **Rolf von Heidenstam,** Lord Chamberlain to Sweden's King.

★ ★ ★

Basis for the honor was Mr. Berg's "outstanding leadership in promoting better relations between Sweden and the United States." Mr. Berg, who was "completely surprised" at receiving the decoration, lives at 16 Massachusetts Avenue.

★ ★ ★

Mr. von Heidenstam also presented a crystal bowl to the company from Aga Corporation, largest stockholder of the New England High Carbon Wire Co. This is a Swedish organized holding company with world wide interests.

★ ★ ★

Among the 750 who attended the party were company directors, besides Mr. Berg and Mr. von Heidenstam, **Steen L. Johnson** of Millbury, **Robert C. Johnson** and **Sixten F. Wollmar** of Hartford, and former directors **Frank Kilmer** of Grafton and **Warren G. Harris** of Millbury.

★ ★ ★

The program included a tour of the plant, dinner under a tent, Mr. Heidenstam's speech and presentation of service awards to 90 of the company's 275 employees. Awards were made by Mr. Berg and Steen L. Johnson, executive vice president of the company.

Caskey to Manage Naugatuck Chemical

John E. Caskey has been elected a vice president of **United States Rubber Co.** and general manager of the company's **Naugatuck Chemical Division, H. E. Humphrey Jr.,** president, announced recently.

★ ★ ★

Mr. Caskey succeeds Vice President **John P. Coe,** who will handle the company's interests in the transfer of synthetic rubber plants from the government to private industry.

★ ★ ★

At the same time, Mr. Caskey announced that **George R. Vila,** formerly general sales manager of Naugatuck Chemical division, will become assistant general manager of the division.

Mr. Caskey and Mr. Vila will direct all sales, research and production activities of Naugatuck Chemical division which has chemical plants in Naugatuck, Conn.; Los Angeles, Calif.; Painesville, Ohio; and Baton Rouge, La.; operates two synthetic rubber plants for the government in Naugatuck, Conn., and Port Neches, Tex., and the Kankakee Unit of Joliet Arsenal, Joliet, Ill., manufacturing high explosives for the armed forces.

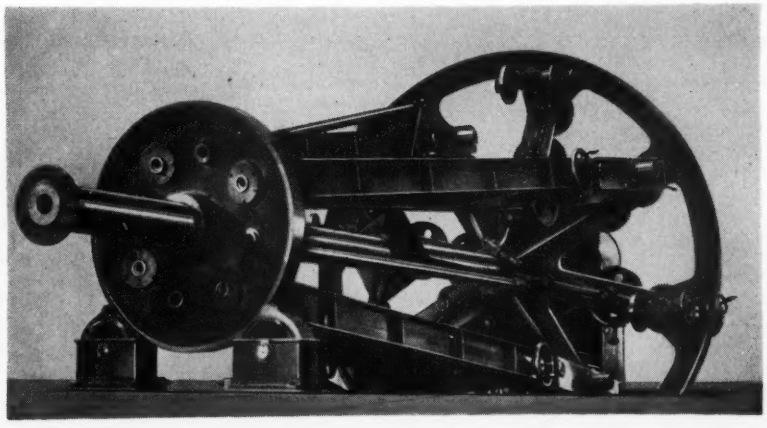
★ ★ ★

Naugatuck Chemical, which is the fastest-growing division of the rubber company, is the largest

MAILLEFER S.A.

RENENS - LAUSANNE (SWITZERLAND)

MACHINERY FOR THE WIRE INDUSTRY



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Screw-Head Slotting Machines

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High Efficiency

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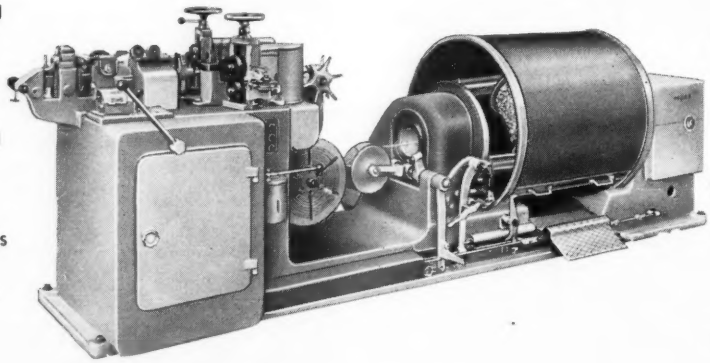
Roofing Nail Machines

Tack Machines for Making:

Shoe Tacks—Cut Tacks—Wire Tacks



Machines for Making Wood Screws:

Single Stroke and Double Stroke Presses

Head Turning and Slotting Machines

Thread Cutting Machines

Thread Milling Machines

Wire Forming Machines

Staple Making Machines

High Speed Barbed Wire Machines

Wire Straightening and Cutting Machines

Illustrated above: Latest type of High Speed Barbed Wire Machine Model BSD N (Tifon)

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Two years ago we exhibited and demonstrated our equipment in America. Another demonstration will be held to show the well-known

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HAUL-OFF CAPSTANS
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manufacturer of rubber chemicals in the nation. It is the third largest producer of polyvinyl chloride resins used in plastic upholstery, shower curtains, draperies, wire coatings and hundreds of industrial plastics. It is also a major producer of polyester resins, specialty synthetic rubbers and agricultural chemicals.

Colorado Fuel & Iron Opens New Seamless Tube Mill at Pueblo

The Colorado Fuel & Iron Corporation has officially opened its new $30 million seamless tube mill in Pueblo. The new mill, the first west of the Mississippi, will be an important supplier of seamless steel tubing and casing to the oil and gas industries of the western United States and Canada, according to **Charles Allen, Jr.,** chairman of the board of directors of C. F. & I.

★ ★ ★

The completion on schedule of this large plant marks an important forward step in the industrial growth of the West. Seamless pipe produced here will be readily accessible to the great oil and gas fields of Oklahoma, Kansas, Wyoming, west Texas, the Pacific coast, and western Canada.

★ ★ ★

The ultra-modern new industrial structure covers more than ten acres under one roof, including billet yard and pipe storage. **A. F. Franz,** president of C. F. & I., stated that when full production is reached the mill will turn out over 150,000 net tons of seamless pipe a year.

★ ★ ★

Mr. Franz pointed out that the new mill is the latest milestone in C. F. & I.'s long-range program of expansion and diversification. Today, in addition to its fully-integrated steel plant at Pueblo, C. F. & I. operates 13 plants in six other states. C. F. & I. employs more than 22,000 persons Mr. Franz added.

Changes Made by Westinghouse

In reorganization of manufacturing operations at **Westinghouse Electric Corp.'s** lamp division, Bloomfield, N. J., the following appointments are announced: **James E. Woodall** was made manager and **William J. Williams** manager of manufacturing engineering. **Elwood W. Noxon** is manager of northern plants, succeeded by **Charles T. Nichols** as manager of southern plants.

Heads Technical Service on Coast for Naugatuck

William C. Imholz has been named to head the West Coast plastics technical service group of the **Naugatuck Chemical Division,** United States Rubber Co., it has been announced by H. M. Parsekian, plastics sales manager.

★ ★ ★

A graduate of the University of Illinois, Mr. Imholz has been with Naugatuck since he joined its production department in 1944. The following year he was assigned to plastics research.

★ ★ ★

Mr. Imholz will make his headquarters at Naugatuck Chemical's Los Angeles, Calif., office, 5901 Anaheim-Telegraph Road.

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HIGH SPEED
STRANDERS
Planetary or Tubular Types
TAKE-UPS—Hydraulic, Pneumatic or Mechanical Lifts
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Equipment designed to your special requirements. Inquiries invited!
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8-Cradle Planetary Strander equipped with Backtwist Gears and auxiliary Taping Heads
Over a Half Century of Processing Experience
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Stranders, Cablers, Complete Tinning Plants
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Wire Processing Equipment
MANUFACTURING COMPANY
30 CHURCH STREET, NEW YORK 7, N. Y.

A Review of Recent Wire Patents

No. 2,650,509, WIRE AND TUBING ROLLING MACHINE, patented September 1, 1953 by Donald E. McCray and Donald C. McCray, Fairview, Pa.

The inventors aim to provide a machine wherein greater reductions may be made in base stock in a single operation.

★ ★ ★

No. 2,650,638, SPRING COILING DEVICE, patented September 1, 1953 by Curt I. Johnson, Vestal, and James A. Nord, Johnson City, N. Y., assignors to International Business Machines Corporation, New York, N. Y., a corporation of New York.

This is a portable device and capable of being employed to provide a variety of coiled wire springs.

★ ★ ★

No. 2,650,768, COIL-WINDING APPARATUS, patented September 1, 1953 by George Stevens, Chicago, Ill.

A device for winding a wire coil progressively is patented, including a rack; a stop for limiting the travel of the rack; and a handle for returning the rack, after it has reached its limit of travel, to its original position.

★ ★ ★

No. 2,650,771, WIRE REELING MACHINE, patented September 1, 1953 by Kenneth O. Marion, Detroit, Mich.

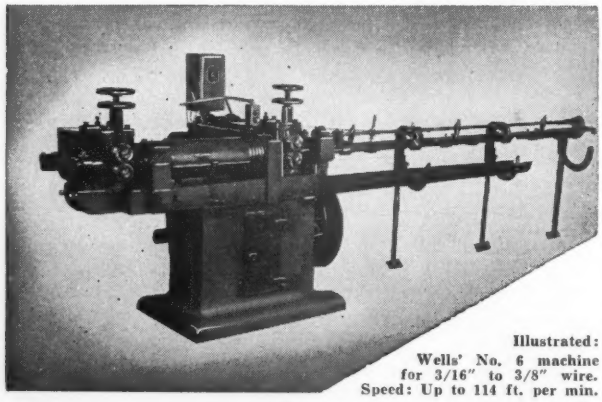
Included is a collapsible reel from which the wire may be removed and a device to prevent rotation of the machine while a reel is being raised or lowered.

★ ★ ★

What do you want in your

STRAIGHTENER and CUTTER?

- **DEPENDABILITY?** **WELLS machines provide day-in, day-out continuous operating service.**
- **SPEED?** **These automatic rotary machines will not only give you speed, but accuracy as well.**



Illustrated: Wells' No. 6 machine for 3/16" to 3/8" wire. Speed: Up to 114 ft. per min.

Cuts wire in any length from 7½" up to 25'. Special attachment furnished on order for long lengths. Straightener flier runs in ball bearings. Gear drive and motor enclosed in base. Door provides accessibility.

58 years of experience and continuous engineering, with use of finest materials, have put WELLS machines in a class by themselves for excellence of performance. Built to handle the toughest jobs, year after year, with little or no servicing. Supplied in a complete range of sizes.

Send for Catalog covering the full line.

Frank L. Wells Company

KENOSHA • 5821 Fifth Avenue • WISCONSIN

Builders of Fine Wire Working Machinery

No. 2,650,772, STRAND SUPPLY APPARATUS, patented September 1, 1953 by John B. Gray III, Essex, and Samuel M. Martin, Baltimore, Md., assignors to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

The apparatus is adapted to supply wire to a continuous extrusion and vulcanization apparatus for forming a coating upon the wire.

★ ★ ★

No. 2,650,777, WIRE UNWINDING SPOOL AND SUPPORTING STRUCTURE, patented September 1, 1953 by George W. Robbins, Arlington, Ind.

A wheeled truck is disclosed on which a reel of wire may be detachably mounted after application to a spool and a device is included to afford frictional resistance to unwinding of the wire from the spool.

★ ★ ★

No. 2,651,104, METHOD OF AND APPARATUS FOR DISPLACING CONTINUOUSLY A FLEXIBLE BAND OF SOLID MATERIAL THROUGH A LIQUID TREATING CHAMBER, patented September 8, 1953 by Marcel Giros, Ancerville, France.

Flexible metal bands are treated by continuously helically pre-forming the bands outside the treating tanks along a curved path, feeding continuously these helically pre-formed bands through the treating tanks along a natural helical path of constant curvature, supporting these bands in the tanks at points above the treating tanks, and leading the helically formed bands out of the treating tanks.

★ ★ ★

No. 2,651,288, LIQUID APPLYING DEVICE FOR CABLES, WIRES, AND THE LIKE, patented September 8, 1953 by Clarence J. Reigh, Altoona, Pa.

Applicator discs are provided which are capable of swinging movements but normally bear against the wire or the like by reason of their own weight.

★ ★ ★

No. 2,651,608, ELECTRODEPOSITION OF ALUMINUM FROM NON-AQUEOUS SOLUTIONS, patented September 8, 1953 by Abner Benner, Chevy Chase, Md., and Dwight E. Couch, Washington, D. C., assignors to the United States of America as represented by the Secretary of Commerce.

A process is disclosed which comprises electrodepositing aluminum from a bath consisting of a mixture of an ether selected from the group consisting of ethyl ether, ethyl n-butyl ether, a mixture of ethyl and butyl ethers, anisole, phenetole, and di-phenyl ether, a metal hydride at 0.5 to 1 molar selected from the group consisting of lithium hydride, lithium aluminum hydride and aluminum hydride; and anhydrous aluminum chloride at from 1 to 4 molar.

★ ★ ★

No. 2,651,609, METHOD OF ELECTROPLATING COPPER, patented September 8, 1953 by Allan E. Chester, Highland Park, III., assignor to Poor

& Company, Chicago, Ill., a corporation of Delaware.

This is a method of controlling the electrodeposition of copper from an acid copper sulfate plating bath onto an electrically conducting object of a type in which the copper would normally be deposited in greater concentrations in some areas than in others by a direct plating current.

★ ★ ★

No. 2,651,610, METHOD OF ELECTROPLATING ZINC, patented September 8, 1953 by Allan E. Chester, Highland Park, Ill., assignor to Poor & Company, Chicago, Ill., a corporation of Delaware.

Here the method is for controlling the electrodeposition of zinc from an acid zinc sulphate plating bath onto an electrically conducting object of a type in which the zinc would normally be deposited in greater concentrations in some areas than in others by a direct plating current.

★ ★ ★

No. 2,651,823, CHAPLET, patented September 15, 1953 by Harvey F. Hohlfelder, North Perry, Ohio, assignor to The F. Hohlfelder Company, Cleveland, Ohio, a corporation of Ohio.

This device is adapted to be positioned substantially entirely within the metal receiving cavity of a mold and for supporting a core or the like therein.

★ ★ ★

No. 2,652,630, WIRE AND CABLE REWINDER, patented September 22, 1953 by Thomas K. Niland, Houston, Tex.

The rewinder is adapted for use with a metering device for cable received on a drum and measured as it is unwound therefrom onto a power-driven reel, or as it is unwound from the cable to measure a desired length thereof.

★ ★ ★

No. 2,652,986, WIRE GUIDE, patented September 22, 1953 by Benjamin B. Scott, Schenectady, N. Y., assignor to General Electric Company, a corporation of New York.

It is stated that this guide is particularly useful in the manufacture of precision resistances.

★ ★ ★

No. 2,653,048, FISH HOLDER, patented September 22, 1953 by Daniel A. Novak, Calmar, Iowa.

This holder mainly comprises a single length of wire bent to shape.

★ ★ ★

No. 2,653,115, METHOD OF PICKLING, patented September 22, 1953 by Ralph M. Drews, Cleveland, and Harold L. Farling, Garfield Heights, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey.

The method of pickling a ferrous metal article comprises the step of contacting the article at a temperature of about 300°F. with a pickling bath at a temperature between 180°F. and about 210°F.

★ ★ ★

No. 2,653,630, APPARATUS FOR FORMING WIRE COILS, patented September 29, 1953 by Stephen A. Platt, Wheaton, Ill., assignor to Wilbur B. Driver Company, Newark, N. J., a corporation of New Jersey.

There are nine claims to this apparatus which is largely pneumatically operated.

★ ★ ★

No. 2,653,631, SUPPORT WIRE FORMING APPARATUS, patented September 29, 1953 by Clayton T. Vaughan, Circleville, Ohio, assignor to General Electric Company, a corporation of New York.

Apparatus for bending a group of filament support wires extending radially outward from an end of a lamp stem is disclosed.

★ ★ ★

No. 2,653,632, EYE FORMING MECHANISM, patented September 29, 1953 by Herbert A. Corbett, Auburn, N. Y., assignor, by mesne assignments to Auburn Fishhook Company, Inc., Auburn, N. Y., a corporation of New York.

The apparatus is adapted to form the eye portion of wire fishhooks.

★ ★ ★

No. 2,653,643, APPARATUS FOR UNCOILING SHEET METAL, patented September 29, 1953 by Harvey D. Miller, Youngstown, and John C. Holdgate, Cortland, Ohio, assignors to The McKay Machine Company, Youngstown, Ohio, a corporation of Ohio.

Uncoiling apparatus is disclosed for use with stock pulling means and of the type wherein strip material being uncoiled is bent reversely about a working roll and wherein the coiled material is confined at the point of departure of the material from the coil by means of pres-

JLE

SERVING THE WIRE INDUSTRY THROUGHOUT THE WORLD

- Caterpillar Pull-outs
- Standard Sets of Spark-Testing Equipment
- Take-ups and Re-spoolers
- Reelers
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- Special Machinery for the Wire Industry
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- Hi-Pot Test Sets
- Cable Handling Equipment for Warehouse Use

See Page 1184 for News of JLE Double-Head Coiler Class F

JAMES L. ENTWISTLE CO.

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European & South American Agents: M. CASTELLVI, INC. 150 BROADWAY, NEW YORK 38, NEW YORK

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JLE JLE JLE JLE JLE

sure contact between the working roll and the coil.

★ ★ ★

No. 2,653,771, ELECTRIC COIL WINDING MACHINE, patented September 29, 1953 by Frank Brand Turner, London, England, assignor to International Standard Electric Corporation, New York, N. Y., a corporation of Delaware.

This machine is of the type having a winding ring rotatable in a circular path through an annular core for winding turns of wire on to the core.

★ ★ ★

No. 2,653,772, WINDING MACHINE, patented September 29, 1953 by Benjamin B. Scott, Schenectady, N. Y., assignor to General Electric Company, a corporation of New York.

Twelve claims are in this patent to a resistance winding machine which includes a variable speed gear between the driving means and feeding means for moving the feeding means at predetermined adjustable speeds to feed the wire to the support in a predetermined spaced turn relation.

★ ★ ★

No. 2,653,773, WIRE-SPOOLING APPARATUS, patented September 29, 1953 by Benjamin H. Davis, Noank, Conn., assignor to The Standard Machinery Company, Mystic, Conn., a corporation of Connecticut.

A guide unit is included comprising an externally-threaded sleeve splined to and axially slidable on a shaft and a wire-guide threadedly received by the sleeve and held against rotation therewith so as to be moved axially thereon on rotation of the sleeve and shaft for association with a device; for shifting the sleeve on the shaft into two positions in which the wire-guide is in operative alignment with drums on the carriers, respectively.

★ ★ ★

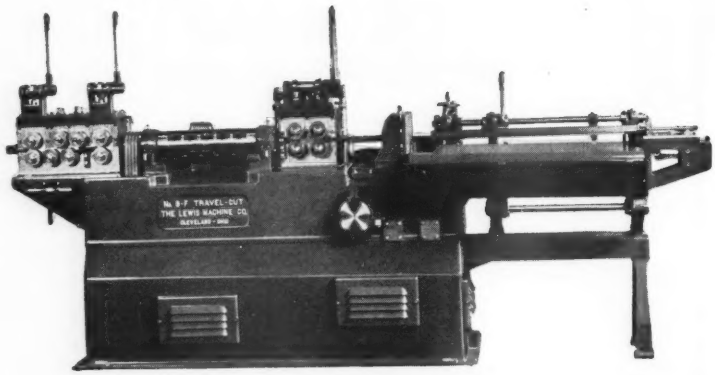
No. 2,653,854, CORROSION INHIBITING PACKAGING MATERIAL AND METHOD OF MAKING, patented September 29, 1953 by Charles H. Schaar, Chicago, Ill., assignors to The Cromwell Paper Company, Chicago, Ill., a corporation of Illinois.

A packaging material for inhibiting rusting and corrosion of metallic articles packaged therein is disclosed, comprising a paper sheet having uniformly coated thereon an effective quantity of the reaction product of dicyclohexylamine and caprylic acid.

Fast, Accurate, Economical

STRAIGHTENING and CUTTING

with LEWIS TRAVEL-CUT



22 Models to handle from .012" to ¾" Round, Hex, Flat, Shapes.

Simple in design, rigid in construction, Lewis TRAVEL-CUT will deliver continuous dependable service under the most severe, high production conditions—day in, day out. Feeds wire from the coil, straightens accurately, gauges to uniform length, and cuts clean without stopping the wire. For steel, brass, aluminum and alloy wire. Cut your cutting costs with the Lewis TRAVEL CUT. Full details on request.

Exclusive Representatives

EAST: Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

MIDDLE WEST: Steel & Wire Machinery Co., 15457 Euclid Ave., Cleveland 12, O.

CENTRAL: Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California.

CANADIAN: Empire Engineering Co., 738 Dundas St., East, Toronto, Ont., Canada

CONTINENTAL EUROPE: Gaston E. Marbaix Ltd., Devonshire House Vicarage Crescent, London S. W. 11, England.

The LEWIS MACHINE Company

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Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne

Review of ASTM Research

The American Society for Testing Materials has announced the availability of reprinted copies of the "Review of ASTM Research" as published in the December 1952 and January and February, 1953, ASTM Bulletins.

★ ★ ★

This material, prepared by the ASTM Administrative Committee on Research, summarizes the work of the various technical committees of the Society as of May, 1953.

★ ★ ★

Copies of this 22-page pamphlet are available, without charge, from ASTM Headquarters, 1916 Race Street, Philadelphia 3, Pa.

New Stainless Steel Wire Mill

Mass-produced precision stainless steel wire has become one of Metropolitan New York's fastest growing industrial items according to **Herbert Kenmore,** President of **Kenmore Metals Corporation** of Jersey City, N. J.

★ ★ ★

Citing the rapid growth of Kenmore's block-long plant, Mr. Kenmore explained that this new industry has been developed in response to the needs of the Signal Corps for Spiral-Four Communications Cable and made possible by

production based on a new principle. Stainless steel wire, he said, is now being supplied also for the needs of many commercial customers.

★ ★ ★

The new Kenmore Mill is equipped with the most modern facilities for mass-production that utilizes revolutionary electroplating techniques for nickel plated steel wire that were introduced by Kenmore Metals a few years ago.

★ ★ ★

The organization is young in the metals industry, but has become a major factor in the fabrication of steel wires. Its rapid development of the stainless steel wire process has been due to the application of modern production equipment and new ideas.

★ ★ ★

Kenmore stainless steel wires are supplied in standard sizes ranging from 3/8" to .005" diameters. Special types of stainless steel wires are also produced. They include tin-plated stainless steel armature banding wire for electric motors and generators, diamond-drawn stainless steel electrode wire for automatic welding copper-plated stainless steel rivet wire, telephone lashing wire and many other special stainless steel wire products.

Iron Ore to Be Recovered for First Time from Nickel Ores

The International Nickel Company of Canada, Limited, has announced that in a historic mining development it was undertaking the production of by-product iron ore from nickel ores in the Sudbury District of Ontario, where its mining operations are centered.

★ ★ ★

Outlining plans for the project, J. Roy Gordon, Vice President and General Manager of Canadian Operations, said the company was beginning immediately the construction of a $16,000,000 plant in the Copper Cliff area as the first unit in an operation which will ultimately yield about 1,000,000 tons of high-grade iron ore a year, in addition to nickel, from Sudbury ores.

Bulletin On Dust Control in Metal Working

How dust can be controlled in metal-working industries as discussed in a bulletin published by American Wheelabrator & Equipment Corp., 1184 S. Byrkit St., Mishawaka, Indiana. Particular attention in the bulletin is given to the use of high-efficiency cloth-tube-type dust collectors in the ventilation of grinding and annealing operations, sprue mills, and blast cleaning equipment. A section is also devoted to the role of cloth filtration in such hot operations as the collection of foundry cupola fumes.

★ ★ ★

Copies of this illustrated folder may be obtained free from the manufacturer. Ask for bulletin 392.

THE WIRE ASSOCIATION
invites wire men to join the organization and participate in its activities.
Write for a booklet on what it is and how it functions to
RICHARD E. BROWN
Executive Secretary
453 Main Street Stamford, Conn.

DRY DRAWING STEEL WIRE?

Make a test run with

NOPCO* DD
the NEW Stearate Type Lubricant

With quality dies at today's high cost, you have everything to gain by trying Nopco DD.

You may find you have doubled the life of your dies. One New England manufacturer indeed, got 12,000 pounds of wire through finishing dies using DD, while with lubricants previously used, his average was 6,000 pounds.

Note that the melting point of Nopco DD is higher than 250° C. This means, of course, that the lubricant lasts longer than lower melting lime soaps of comparable price. Prolongs die life. Produces better wire.

We want you to try this new lubricant . . . to compare results where they count, in the actual working conditions of your own shop. We'll be glad to help by furnishing full information, and samples for testing. Write today.

NOPCO DD, for dry drawing steel wire

PRODUCT DESCRIPTION

A specially processed, high melting point, modified fused calcium stearate type lubricant.

Appearance	—White powder.
Moisture	—Less than 1%
Melting Point	—More than 250° C.
	USES
Type Wire	—High and low carbon steel.
Size of Wire	—Rods to 16 gauge.
Speed of Draw	—1500 to 2500 ft. per minute, and faster.
Number of Dies	—Two to seven dies.

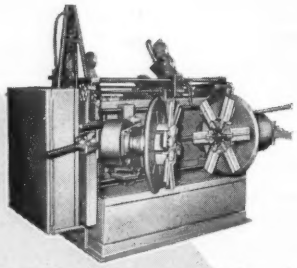
NOPCO
CHEMICAL COMPANY, Harrison, N. J.
BOSTON • CHICAGO • CEDARTOWN, GA. • RICHMOND, CAL.

*Reg. U. S. Pat. Off.

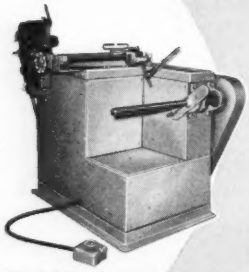
For wet drawing nonferrous metals try:
DURPON* (for intermediate gauge wire)
DURPON L (for heavy wire, rods, tubes)
DURPON FW (for fine wire)

FOR FASTER MORE EFFICIENT WIRE PRODUCTION . . . .

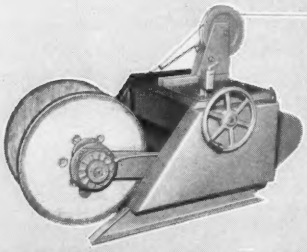
EQUIPMENT



Fully Automatic Continuous Coiler and Respooler



Variable Speed, Constant Footage Respooler



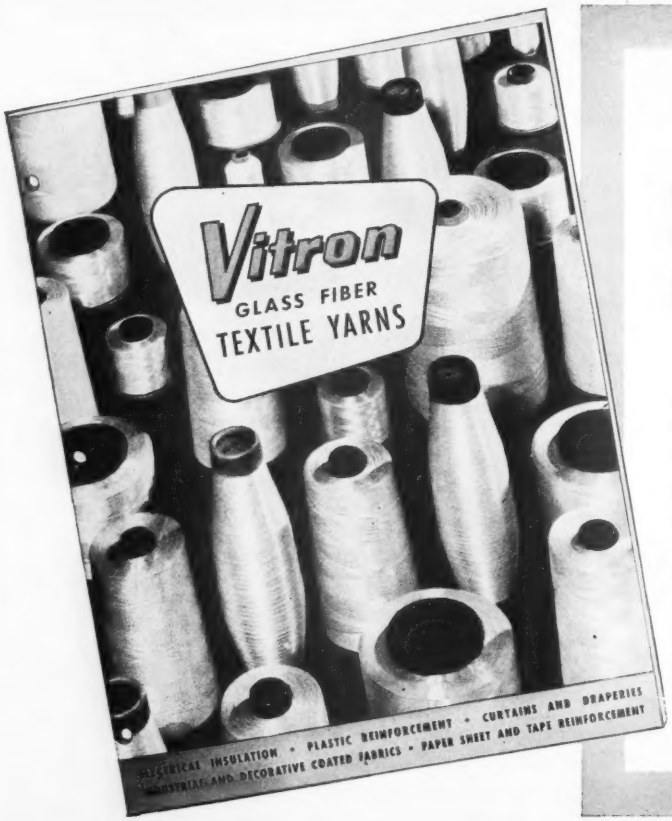
Adjustable Tension Payoff Stand

Designed for more efficient wire production, WIM equipment is engineered to save you time, money and effort. Smooth high speed performance is assured. Continuous dependable operation is featured. The result is a line of wire handling machines that will handle your toughest jobs with little or no servicing. Write today for further information. Our engineering staff will be glad to help work out your problems.

WIRE INSULATING MACHINERY, INC.

Division of Machinery Electrification, Inc.

98 UNION STREET WORCESTER 8, MASS.


Vitron
GLASS FIBER
TEXTILE YARNS
ELECTRICAL INSULATION • PLASTIC REINFORCEMENT • CURTAINS AND DRAPERIES
INDUSTRIAL AND DECORATIVE COATED FABRICS • PAPER SHEET AND TAPE REINFORCEMENT

Q. What process means *uniformity* in glass yarns and fabrics for superior quality glass-plastics products?

A. It's Electronic-Extrusion—the advanced process for glass fiber manufacture—developed, patented and used exclusively by Glass Fibers Inc.

This 8-page booklet will give you the "what" and the "why" on VITRON Glass Fiber Yarn from raw glass batch to finished package. The new glass fiber nomenclature, property tables, synthetic fiber comparison charts are all here too.

Write now for your copy. Glass Fibers Inc., Dept. IM-35, 1810 Madison Avenue, Toledo 2, Ohio.

cold finished bars, sheets, strip, structurals and plate.

★ ★ ★

With a full inventory, the Louisville warehouse, will carry about 4,000 tons of finished steel. The building is a single story structure with 57,500 square feet of floor space.

★ ★ ★

Mr. Ande points out that steel distribution agencies now constitute the largest single market for steel.

The Properzi Process for Continuous Casting and Rolling of Aluminum Redraw Rod

(*Continued from page* 1187)

Figure 2 shows the new Type 5A casting wheel developed by Properzi, which is being furnished on all late model machines, and as a conversion for existing Type 4 machines.

★ ★ ★

This casting wheel has a copper ring mold bolted between two plates, the periphery of which plates are drilled. Jets of water play through the drilled holes upon the copper mold, effecting a rapid heat transfer. The larger cavity permits visual determination of the metal level in the mold, which eliminates the previous manner of making this determination by means of a heat-broken oil film on the face of the belt.

★ ★ ★

A development of particular significance is the fact that the Type 5A casting with the cross sectional area of 1.2 inch. appears to have benefited the electrical conductivity of wire produced for conductor purposes.

★ ★ ★

European specifications for conductivity in Aluminum are slightly less than are the American specifications.

★ ★ ★

As fabricated rod produced from Type 4 cross section, (i.e. ¾ sq") is border line with respect to American conductivity standards. As a consequence, users of Properzi equipment for conductor wire in this country had a choice of alternatives:

1. **To buy premium high purity metal.**
2. **To anneal the finished rod.**

★ ★ ★

The Type 5A casting with its larger cross section may have eliminated the need for making this choice. Recent experience indicates that as fabricated rod is over the American conductivity standards and meets as well the necessary physical requirements.

★ ★ ★

As is well known, the present use of Aluminum Wire for conductor purposes has grown substantially, and the potential tonnage available is very great. The Properzi Process, therefore, does two fundamental things:

1. **It permits semi-integration with a minimum of capital outlay.**
2. **It permits smaller companies economically to gear production of semi-finished materials to their own consumption and down-time becomes far less of a financial burden.**

★ ★ ★

Ilario Properzi is continuing his developmental work, not only on aluminum but on copper as well.

Standardize on ACROPAK* Spools!

Only ½ the Weight!

Light Weight
Precision built
Reduced cost
Longer life
Extra strength
Dynamic balance
Greater production
Low cost reconditioning
Less maintenance
Attractive packaging

YET STRONG, TOUGH, RIGID . . *LONGER LIFE*

ACROPAK Spools will help you cut wire packaging costs because they give longer service, require less maintenance and cost less to ship. They're strong. They'll take repeated shippings and still run true on the arbor. They're machined to close tolerances. You can run them at high production speeds with fewer snags, less toe-out and minimum end breakage.

THEY CUT YOUR SPOOLING COSTS

Best proof of ACROPAK superior performance are the millions of these spools now used by the biggest names in the wire industry. We've proved it to them—let us prove it to YOU.

★ We also make a complete line of heavy-duty shop processing STEEL SPOOLS built to the same high standards of accuracy and rigidity as the famous Acropak aluminum spools.

ACROMETAL PRODUCTS INC.
Division U S Bobbin and Shuttle Co., 616 Fifth Street N., Minneapolis 1, Minn.

STANNOUS SULFATE

Saves Tin!

in liquor finishing operations

because

M & T Stannous Sulfate — a manufactured chemical— saves tin by doing away with many of the inefficiencies which accompany the treating of feather or flake tin to produce stannous sulfate on the job.

More convenient to use, too!

Baths are operable as soon as materials are dissolved. Solutions can be prepared in advance to produce desired colors and coating thicknesses.

AND, additions are made from stock solutions, assuring quick, complete mixing—eliminating any possibility of materials only partially dissolving in the bath—reducing the chances of miscalculating quantities of materials added.

Use M & T Stannous Sulfate for white or straw-color finishes. Write for technical procedure sheet.

METAL & THERMIT CORPORATION
Chemical Division
100 E. 42nd St., New York 17, N. Y.
Specialists in Tin and Tin Chemicals

Copper of course presents many new problems. It melts at a higher temperature and the melting practice is much more involved. It is considerably harder as well.

★ ★ ★

His hope for success with copper is enhanced by his experience with aluminum, and some of the harder aluminum alloys, and it should be pointed out that copper is logically the next step forward, just as zinc followed lead and aluminum followed zinc.

★ ★ ★

The Nichols Wire and Aluminum Co. has been privileged to work closely with S.p.A. Continuus, and it is interesting to note that neither company is, in any sense of the word, a large one.

★ ★ ★

In 1949 the Properzi Process came to attention of the Nichols Company. **Frank P. Leahey,** Executive Vice President and **M. J. Fey,** Executive Engineer, went to Milan, where they witnessed one of the first pilot runs on aluminum. With a full realization on the parts of these men and Properzi that additional developmental work would be necessary, a decision was made to purchase an experimental machine.

★ ★ ★

The Properzi Process seemed basically sound, and so it proved to be.

★ ★ ★

The fact that a small company, without a group of highly skilled technicians could work out the first commercial operation of a continuous casting and rolling process for redraw rod, augurs well for Properzi's ultimate success with copper.

★ ★ ★

Ilario Properzi properly should have presented this paper but could not do so because his command of English is limited. While this is regrettable, in one respect it is fortunate, since it permits a statement of fact that he would be too modest to make, and that is that he is one of the great metallurgical pioneers of this century.

H-D

BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES

SPECIALIZED
ENGINEERING
AND
SPECIALIZED
FACILITIES
AT YOUR SERVICE

Expanding application of twisting principles to the production of many products is reflected by an ever-increasing demand for both H-D standard equipment as well as machines especially engineered to solve varied production problems. Week after week surprising new uses are developed through the close cooperation of our engineering department with manufacturers in many fields.

Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.

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Save up to 1/2* of your labor costs on Finishing and Lapping Tungsten Carbide Dies with a New Type 'M' DYKREX Finishing and Polishing Machine

* Statement from actual user by one of America's largest Tungsten Carbide Die Makers.

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"IT CORRECTS THE DIE"

Write for full information
ROOS TOOL & MFG. DIVISION
DYKREX CORPORATION OF AMERICA
33-35 Bloomfield Ave., Newark 4, N. J.

STATEMENT OF OWNERSHIP, management and circulation, required by the Acts of Congress of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233), of WIRE AND WIRE PRODUCTS, published monthly at Jersey City, New Jersey, for year, 1953.

1. That the names and addresses of the publishers, editor, managing editor, and business managers are:

Publisher, Quinn-Brown Publishing Corporation, 453 Main Street, Stamford, Conn.; editor Edmund D. Sickels. 453 Main Street, Stamford, Conn.; managing editor, none; business manager, Ruth S. Spengel, 453 Main Street, Stamford, Conn.

2. That the owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern its name and address as well as those of each individual member must be given.) Quinn-Brown Publishing Corporation, 453 Main St., Stamford, Conn.; Richard E. Brown, 453 Main St., Stamford, Conn.; Leta B. Brown, 2342 Summit Road, Montecito, California, and Ruth S. Spengel, 453 Main Street, Stamford, Conn.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

RICHARD E. BROWN
Publisher

Sworn to and subscribed before me this 22nd day of September, 1953.

HAZEL R. RANDLETT
Notary Public
My commission expires April 1, 1955

Quality: The Key to Economical Use of Diamond Abrasives

(*Continued from page* 1191)

(a micron being approximately .000040" in average dimension) to a maximum of 8 microns or .00032" in size. The range is then 4-to 8 with an average size of 6, so the grade is called #6. Now the Standard says a little more than just that all the particles must be between those limits. Let's analyze statistically the distribution of the particles on the basis of a scatter pattern. This is what it looks like. On the vertical ordinate we have number of particles. On the hor-

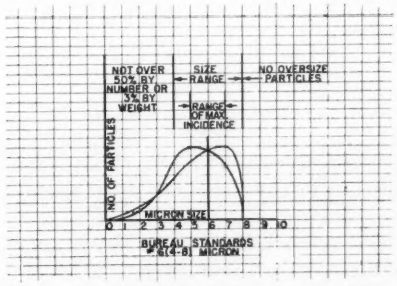
NOT OVER 50% BY NUMBER OR 5% BY WEIGHT
SIZE RANGE
NO OVERSIZE PARTICLES
RANGE OF MAX. INCIDENCE
NO. OF PARTICLES
MICRON SIZE
0 1 2 3 4 5 6 7 8 9 10
BUREAU STANDARDS #6(4-8) MICRON

Figure 11—Particle distribution curve of Bureau of Standards grade #6.

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...specify Apco Mossberg Steel Reels, Spools and Bobbins first!

Profit from fifty years of Apco Mossberg experience and technical skill in providing copper wire, steel wire and wire rope manufacturers with top quality steel reels, spools and bobbins — investigate the complete Apco Mossberg line today. Apco Mossberg reels, spools and bobbins are available in all sizes and types (single heads, double heads) for every purpose. Write now for complete details . . . get your free copy of the Apco Mossberg Steel Reel Booklet. Apco Mossberg Co., Lamb Street, Attleboro, Mass.

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The original Frank Mossberg Co.

BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES

SPECIALIZED
ENGINEERING
AND
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Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.

HASKELL-DAWES
MACHINE CO., INC.
2231 E. ONTARIO ST.
PHILADELPHIA 34
PA.

izontal ordinate we have the particle size. By taking a particle count, as we call it, or counting the number of particles of each size and plotting this information on our graph, we obtain a particle distribution curve.

★ ★ ★

The maximum limit, in this example, is 8 microns and there shall be absolutely no particle larger than 8. The bottom limit is 4 microns and it is at this end that the standard permits some leeway as it is extremely difficult to remove all the fines or particles below 4. You are permitted to have a maximum of 3% by weight or 50% by number. Also, and here is an important point, the high point on the distribution curve must conform to the micron size designation plus or minus 25% of the range, which in this case is 6 microns plus or minus 1 micron. So your high point must be between 5 microns and 7 microns. To meet all these requirements is more difficult than you might imagine.

★ ★ ★

However, most of the difficulty comes in this over-production of fines. When crushing and grading to Bureau of Standard specifications you produce more particles from 0-2 than you can sell or put in any one grade. So your choice is: Throw them away in order to adhere to the Standard, or put them back in and wink at the Standard. Now don't misunderstand me; there are those who adhere to the requirements, but so long as you do not inspect what you buy you are creating a temptation.

★ ★ ★

So again we have the case of the Bureau of Standards producer selling for $3.50 per carat and the "bargain" at $3.30 per carat. Again you are convinced of the quality but this time instead of aluminum oxide we have 10% surplus fines. Again you pay the equivalent of $3.65 per carat for effective diamond. The polarizing microscope will show the processor offers you 100% diamond this time but it also will show up these fines.

★ ★ ★

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ZWEVEGEM
(BELGIUM)
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Tréfileries León Bekaert,
S.P.R.L.

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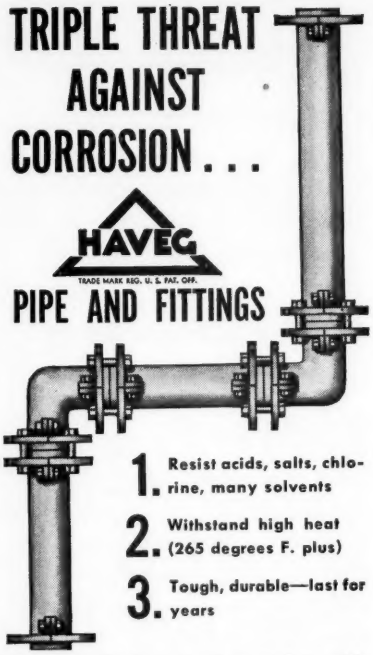
TRIPLE THREAT AGAINST CORROSION . . .

HAVEG

TRADE MARK REG. U. S. PAT. OFF.

PIPE AND FITTINGS



1. Resist acids, salts, chlorine, many solvents
2. Withstand high heat (265 degrees F. plus)
3. Tough, durable—last for years

Beat the high cost of corrosion with proven, genuine Haveg pipe and fittings. Pipe highly corrosive fluids in temperatures as high as 265 degrees F. with a good margin of safety! Since Haveg is not a coating or lining, the possibility of contamination is eliminated.

Haveg is a moldable, thermosetting plastic made by mixing acid-digested asbestos with special resins. Haveg process equipment is unusually resistant to most acids, salts, chlorine, many solvents . . . and withstands extremely high thermal shock. Haveg is really a triple threat against corrosion!

Send for 64-page Bulletin F-6. It contains complete information on Haveg pipe, fittings, valves, pumps, cylindrical and rectangular tanks, heat exchangers, and other corrosion-resistant process equipment. Call your Haveg sales engineer for first-hand facts.

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CLEVELAND 20 Washington 1-8700 | DETROIT 35 Broadway 3-0880
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SEATTLE 7 Hemlock 1351 | ST. LOUIS 17 Hiland 1223

* A Subsidiary of Continental-Diamond Fibre Company.

SEND FOR 64-PAGE HAVEG BULLETIN F-6.

So we see weight of diamond is only one factor, and a minor one, in the intelligent buying of diamonds. Also we see that a polarizing microscope will insure our receiving two of the three important factors in diamond powder, namely purity and accuracy of grade. Obviously, the third important factor of particle shape can also be observed under a microscope.

★ ★ ★

There is one additional point we haven't discussed and that is: "How can I tell I am getting the grade of powder I ordered?" And that is a distinct possibility also, because from the manufacturer's standpoint there is only so much of a grade produced from a crushing of diamond. Yet we know the demand is greater in some grades than in others. So the producer is pinched — he sends a less popular grade in place of the one ordered in the belief that it will be satisfactory.

★ ★ ★

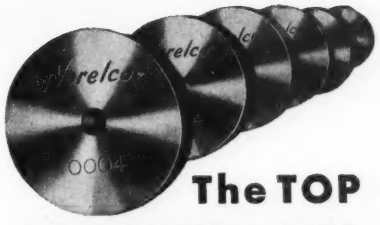
Now the proper way to check for grade size is to have a vernier eye piece in your microscope, but again that costs more money and requires technique. But this problem can be overcome, too. For example, we supply master slides of every Bureau of Standards grade to check against the material purchased.

★ ★ ★

So for a $200 investment you can check everything there is to know about diamond and assure yourself you're getting what you pay for. Isn't that sound business?

★ ★ ★

Well, we have seen generally where diamond comes from, how it's processed to micron grades, what the important factors are for quality, and how you can check those factors. Let's take a brief look at the "proof of the pudding" of quality. We have some cost records here and we wish we had more. I'm surprised at how few wire mills keep accurate cost records on number of dies produced per carat of diamond. And the standard comment you get is: "How can we measure it when today we are working one size die and tomorrow an entirely different



The TOP DIAMOND DIES are made by PHILIPS

For your most exacting wire drawing requirements, standardize on NORELCO Diamond Dies, made by the master craftsmen of PHILIPS in the world's largest, most modern diamond die factory.

Only the very best South African and Brazilian diamonds are used. Each consists of one closed crystal. Less than .4% of all the diamonds mined meet PHILIPS high quality requirements for purity, structure and shape.

These diamonds are drilled to precision tolerances, varying in proportion to the diameter, normally 0.3 to 3.5 microns. Closer tolerances can be supplied, if required.

Let us quote on your diamond die requirements.

North American Philips Company, Inc.
100 East 42nd Street, New York 17, N. Y.

Norelco

Note below the highly polished precision shaped drawing channel of this die for drawing copper which gives a burnished finish to the wire and long life to the die.

BETTER WORKING CONDITIONS

FASTER BUTT WELDING

FASTER ACID NEUTRALIZING

LONGER STORAGE SAFETY

YOU GET THEM ALL WITH

BORAX 5 MOL.

RUST INHIBITOR COATING

LONGER DIE LIFE

...and ONE DIP is all that is necessary for coating steel rods

BORAX 5 MOL offers worthwhile advantages over regular borax as a satisfactory coating material on ferrous rods and wire in preparation for dry drawing. This newer material offers a higher concentration of sodium borate and therefore savings may be realized through reduced transportation, handling, and storage costs. Only about three-fourths as much Borax 5 Mol need be used to equal regular borax... yet you get the same worthwhile results!

WRITE FOR YOUR COPY OF NEW SERVICE BULLETIN

PACIFIC COAST BORAX CO.

DIVISION OF BORAX CONSOLIDATED, LIMITED

NEW YORK • CHICAGO
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PHILADELPHIA

MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

size?" That's a valid argument on a short term basis, but over a period of time those variables equal out. We wish there were more of you that kept records so we would have something to test against rather than just operator preference for a certain type or form of diamond.

★ ★ ★

In a cost analysis conducted by Penn Brass and Copper Company of Erie, Pa., they determined an average die cost of 2¢ for diamond abrasives. This was calculated over a period of several months and correlated with their production for that same period. Incidentally, they run large size dies for tubing, which takes proportionally more diamond than the smaller wire dies.

★ ★ ★

NUMBER DAYS	NUMBER DIES MADE	SIZE RANGE FROM	TO
23	465	0184	067
27	529	017	078
21	586	020	087
27	486	0255	110
19	279	016	053
33	628	016	041
31	933	032	070
34	607	0258	038
22	421	016	097
22	493	017	070
19	367	0285	110
23	440	0165	076
23	450	016	068
29	560	030	061
13	358	0248	128
27	516	0167	125
36	695	0248	086
35	676	0167	070
22	42[illegible]	0148	089
15	293	0275	070
27	468	017	065
33	430	027	057
	11,388 (Total dies polished)		

Total jars Elgin Diamond used - 20 (5 grams each) 110 grams

Figure 12—Record of diamond consumption by die size made by National-Standard Company of Niles, Michigan. * * * * * * *

Or here is an even more detailed chart on National-Standard, Co. giving costs of diamond for specific size dies. When a mill has this kind of information it is in a position to judge relative costs and benefits of quality in the diamond abrasive being used. There is no substitute for quality. You should be in a position to judge quality when you buy and measure the results when you use it. This applies as much to diamond abrasives as it does to any other item you buy for your plants.

★ ★ ★

MASON SPOOLS SAVE YOU MONEY!

The Reason is Simple . . .

Mason spools save you money because they cost less—yet satisfy your most rigid requirements for non-returnable use!

Each Mason spool is manufactured by modern mass-production methods that assure sturdy construction at minimum cost. Lithographing operations are efficiently performed in Mason's own plant to maintain exact quality control.

Find out more about how Mason can reduce *your* spool costs. Mason spools are available in all standard head and barrel sizes. Write today for more information.

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MASON CAN COMPANY OF OHIO
Greenville, Ohio

BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES

SPECIALIZED
ENGINEERING
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HASKELL-DAWES
MACHINE CO., INC.
2231 E. ONTARIO ST.
PHILADELPHIA 34
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Nylon Covered Wire Rope

Jewel-like ropes may soon be appearing in many places and on many products because Wirelon ropes are now being manufactured in numerous gem-like colors by **Rochester Ropes,** Culpeper, Virginia. Wirelon is made by a process in which nylon is extruded solidly around a core of wire cable. First made only in natural nylon color, the addition of dyes to the nylon now makes it possible to achieve lustrous, gem-like effects.

★ ★ ★

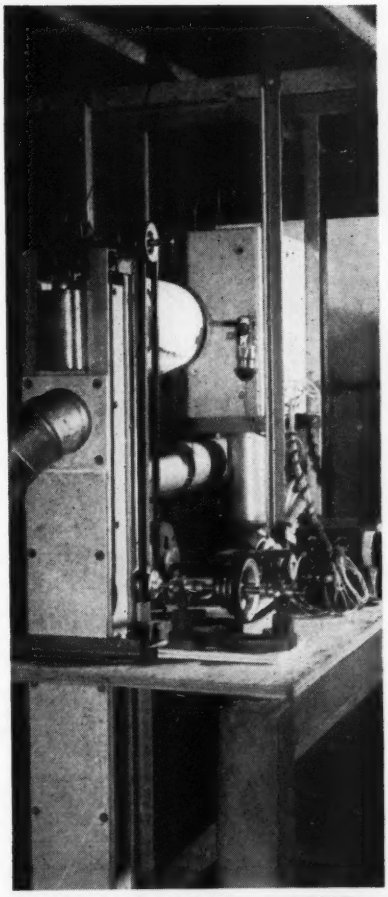
In addition to its striking looks, Wirelon has a combination of properties not found in any other kind of rope. It has up to 500 per cent longer life than uncoated cable, is smooth and safe to handle, and withstands abrasion, kinking and corrosion. It is made in sizes ranging from 3/64 to 1⅛-inch diameter.

Production and Quality Control, Plus Mill Information—Sales Department Musts

(*Continued from page* 1193)

I do want to mention that your sales departments act as buffers in shielding you from a great many specifications you never hear about. For example, wire orders come to us with descriptions such as bright wire, bright rounds, bright rods, etc.; when in reality, the customer wants bright industrial quality wire. Your sales department must translate such orders so that the mill copies of orders will call for the established standard grades of wire. We have one customer who for years has ordered bright cold rolled wire—he wants round wire and does not further cold roll this material himself — but he continues to use his cold rolled wire description. With all these different non-standard specifications showing up on customers' orders, we feel the production departments can do a great service, if they will call and check any deviations from the standard procedures they have followed in producing past orders for given accounts.

★ ★ ★



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It may not look like the equipment in your plant, yet this pilot lacquer tower duplicates your own lacquering operations.

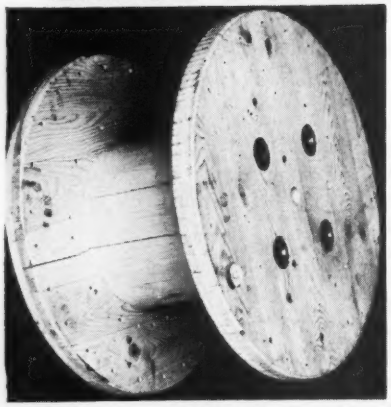
It is used in the research laboratories of New England Lacquer to test thoroughly all formulated lacquers under actual on-the-job conditions. This and other modern research facilities enable us to formulate lacquers which satisfy your most rigid requirements.

Let our research facilities solve *your* lacquer problems. Write today!

The above photograph is one of many contained in an eight-page brochure describing our facilities to serve you. Write for your copy of the complete brochure!

NEW ENGLAND LACQUER CO.
150 KING PHILIP ROAD
EAST PROVIDENCE, R. I.

LARGE BOLTED REELS for
WIRE ROPE
and
ELECTRIC CABLE



View of typical bolted reel.

Made in diameters of from 12" to 48" and furnished knocked-down or assembled. Sturdily constructed of air-dried lumber, using our Linderman process of jointing and well-nailed for strength and rigidity, these strong reels will take severest punishment. Our reels are made to customers' specifications as to size, number of bolts, size of washers, borings and number of plies in each flange. Painting or stenciling can be done as customers may request.

Shipped to any point in New England by truck.

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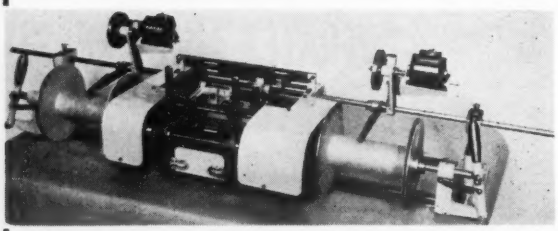
WINCHESTER REEL COMPANY, Inc.

ASHUELOT, N. H. **Tel.: WINCHESTER 163-2**

Our Products Carry Reel Loads.

A NEW BENCH SPOOLER



Illustrated:
THE BOYD No. 6000 BENCH SPOOLER

- **RUGGED PRECISION ENGINEERED SIMPLICITY**
- **CONSISTENTLY ACCURATE WINDING**
- **SUPERIOR PACKAGE APPEARANCE**
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Available with one or two spindles having common traverse and individual drive for each spindle. The spindles are started independently by manual control and halted automatically by predetermining counters and solenoid action. Traverse rates and travel are easily and quickly changed to suit your needs. Screw reversing mechanism controlling traverse can be adapted to wire, tape, plastic, etc. as required.

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1434-38 Callowhill Street **Philadelphia 30, Pa.**

And now for point #5. By keeping your sales department advised of production difficulties or improvement of schedules, you can help eliminate the peaks and valleys in your own production. We hear of blooming and bar mill, and rod mill breakdowns. There is no problem explaining major production problems of the mill to customers, but many minor problems occur about which your sales department will not hear. For example, if you have, or anticipate, down time on equipment, which is beyond ordinary maintenance, or you know that unusual absenteeism occurs, and you will so advise your sales department, they can keep customers much happier. In the event changed production procedures are effected, which, for example, will change tonnage produced on given sets of wire drawing blocks, you should so notify your scheduling department. If you do not, you are inviting overscheduling on some sets of equipment, or will have open time on others. It is difficult to explain shipping delays to customers, unless we in sales have been forewarned. It can also be very difficult to get orders on short notice for given gages of wire to fill out mill schedules.

★ ★ ★

To sum up: If the mill will produce and ship quality products, keep shipping promises, maintain reasonable flexibility for changes in orders, help sales catch mistakes in customers' orders, and keep sales advised of mill capabilities, then your sales department is in a position to solicit orders aimed at capacity operation in their mill.

★ ★ ★

Rubber and Plastic Insulation in Cable

(*Continued from page* 1198)

all Neoprene produced. Through its use as a protective sheath more durable and reliable portable cables for mines, dredges, etc., as well as cables for direct burial in the ground and exposure to sunlight overhead have been developed. Unfortunately it has important limitations which are showing up in some services. These could perhaps be anticipated by more complete eval-

uation. We have made some progress but it is only a beginning.

★ ★ ★

In the Spring of 1939 we reviewed the status of synthetic polymers in the Cable Industry before the American Chemical Society at Baltimore. Recently on rereading that review in the August 1939 issue of Industrial and Engineering Chemistry, I was reminded how much plastics have replaced rubber, and yet we have seen that more rubber is being used than was ever used before. I do not have any exact figures on the ratio of plastics used to rubbers, but in the cable industry I believe plastic resin would approximate 50% of rubber. The use of thermoplastic compounds is bound to play an increasingly important part in the growth of our Industry. The principal plastic used is plasticized polyvinyl chloride. Much progress has been made in the production of the resin, plasticizers, stabilizers and in processing. Compounds of PVC have displaced rubber very largely in the field of building wire and appliance wiring, and its use is growing. Certain compounds have been approved for underground use and others for operating temperatures as high as 105°C., and proposals for even high ratings have been made. I believe we are remiss in our use of plastics that we do not study the material and design tests to develop more clearly both its good and poor qualities. Approvals of 105°C. have been given to compounds because they age well at temperatures higher than this, yet the fact that they are thermoplastic and deform as readily as materials approved for operation at lower temperatures is neglected. Progress has been made in evaluation of rubber and plastics by the development of non-destructive tests such as corona-level testing and electrical stability in water.

★ ★ ★

A more fundamental understanding of the phenomena concerned with these tests is still required if we are to proceed soundly on the program as outlined in our opening. We need to understand the mechanism of the absorption

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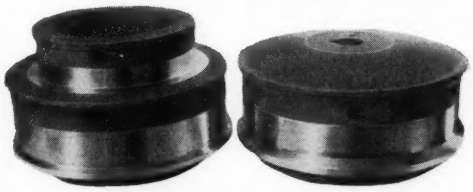
Saves down time . . .
wire rejections . . .
increases production



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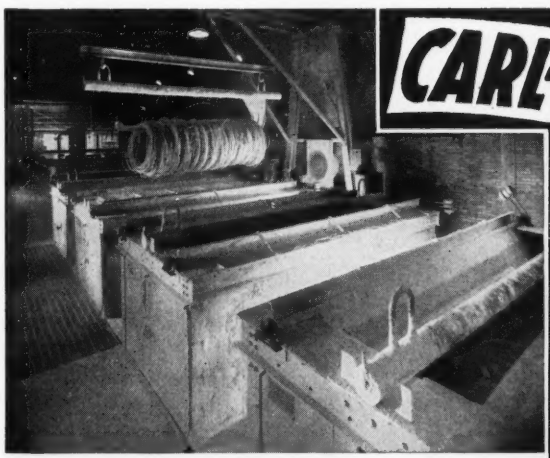

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ROD BAKERS

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2,296,361
2,323,828
CANADA
396,144
401,589

ALSO OTHER TYPES OF INDUSTRIAL OVENS AND FURNACES

GREATER SPEED AND FUEL ECONOMY PROVES OUTSTANDING ENGINEERING

Carl-Mayer Hi-Speed Rod Bakers have an exclusive heating arrangement, combining faster baking with amazing fuel economy—and a patented Blow-Off feature which removes moisture without bumping or agitating the coils. *WRITE FOR BULLETIN NO. 350.*

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CLEVELAND, OHIO

High Quality

COPPER and BRONZE WIRE

High Carbon and Low Carbon

Specialty Steel Wire

Spencer wire corporation

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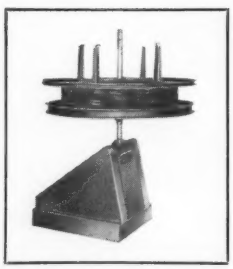
Plants at Union, N.J., Hillside, N.J., West Brookfield, Mass.

MOSLO "SHIFTWEIGHT"

COUNTER-BALANCED WIRE REELS

Takes the Manual Labor out of loading a Reel with Wire. Just unlock the knurled spindle by a twist of the wrist, tilt the reel assembly 90°, roll coil of wire to reel, lift 6″ on to centering arms, release lock by twist of wrist, use spindle as lever to lift, and the *Weighted Counterbalance does the rest!*



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$190.00 F.O.B. Cleveland

Capacity 300 lbs.—Min. Coil I.D. 10″—Max. O.D.—41″.
All welded steel construction—Brake Equipped.

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of water by plastics as distinguished from rubber if we are to develop reliable tests. We must develop tests to evaluate materials according to their intended uses and not fit them in the pattern of rubber or some other material, and we should interpret these tests in the light of experience. Several moderate tests of different properties give a more reliable evaluation of the characteristics than a severe test for a single property.

★ ★ ★

No discussion of cable insulation could leave out polyethylene. This has grown in use to be one of the most versatile and useful of the new materials. While for a long time its use was confined to high frequency, it has entered the field of control cables, communication cable, and power cable up to as high as 15,000 volts. It is now the standard insulation for field wire of our Signal Corps, and has been recognized as one of the important insulations of our industry by the adoption of the first Industry Standard specification for its use by IPCEA. At the July 1952 meeting of A.I.E.E. an all day symposium was devoted to this relatively new material. Since the results of that symposium are published by A.I.E.E. I will not review them.

★ ★ ★

Simply to mention some of the other plastics used and available, such as Nylon, cellulose plastics, Kel-F, Teflon, and now Hypalon coming on the horizon, brings forcibly to our attention the need, mentioned above, for our development of sound yardsticks of measurement and evaluation as guidance to our supplier and those concerned with the operation of cables. New materials and requirements may need new methods and equipment for proper fabrication. Too often we require that new materials fit existing equipment and thereby impose a limitation on the ultimate attainment of our aim.

★ ★ ★

In 1939, in the review referred to previously, I endeavored to set down the properties desired in a plastic. Polyethylene fills many of these requirements, but like most

thermoplastics, has a lower softening point than is ideal. The properties then set down were:

1. The plastic is heat reactive.
2. It has a high degree of elasticity and can be compounded to have a high modulus at low elongation.
3. It is more impermeable to moisture and gases than is rubber; it is unaffected by oils and solvents.
4. It is unaffected by temperatures of 100°C. and may be indefinitely operated at that temperature; it is flexible at —40°C.
5. It is unaffected by sunlight and ozone.
6. It has a high dielectric strength, comparable to rubber; it has a dielectric constant of about 3, and power factor of 1 percent. These properties are maintained with slight change at 100°C.
7. It has no corrosive effect on metals.
8. The cost is comparable to rubber as applied to cables.

We also stipulated that one with better electrical properties and non-flammable, would have added interest. Polyethylene can be made to have a good degree of flame resistance and retain its electrical and moisture-resistant properties. In view of our greater experience today we would no doubt revise the specification for this mythical material and would find in some of the materials available a much closer approach to its realization. A realistic definition of this kind would be useful.

★ ★ ★

Despite the fact that European countries use very little synthetic rubber other than Neoprene, the use of thermoplastics has grown at a tremendous rate there. Polystyrene, PVC, Nylon, and polyethylene — with the exception of polystyrene much of these materials are imported from U. S. or England. Seldom are any of these materials rated at over 50 or 60°C., and ingenious equipment modifications for their proper application have preceded their use. If we can borrow some of this thoroughness without slackening the undoubted advantage of our drive we can accomplish our aim and build soundly the future extension envisioned in our opening paragraph.

Marketing Conditions

(*Continued from page* 1201)

economy! Furthermore, it is doubtful if a cut of this size will ma-

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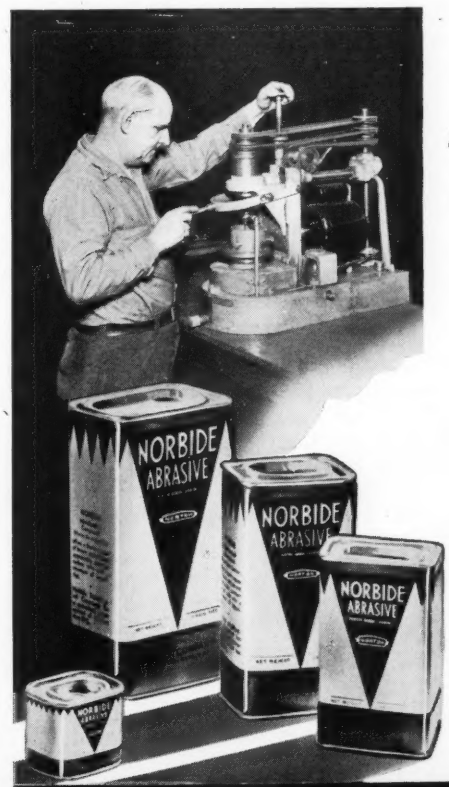

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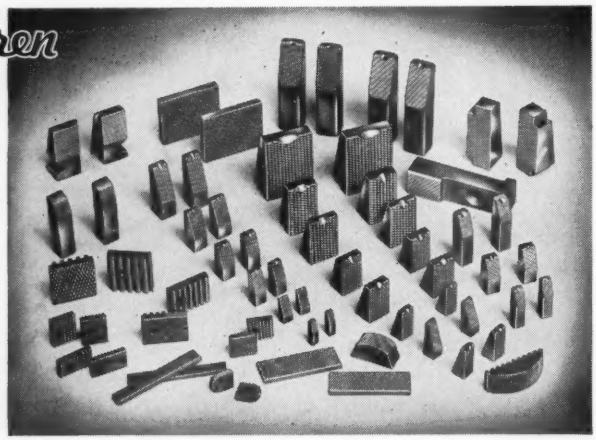

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terialize because it wouldn't get votes, and wouldn't be good politics.

★ ★ ★

Speaking of politics, there is an old story some of you may not have heard:

★ ★ ★

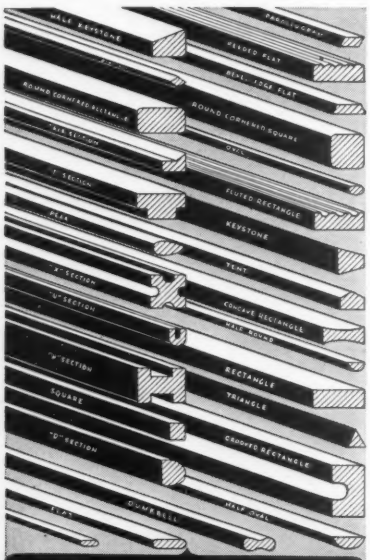
Mr. Murphy, who was a member of the City Council, had been on an extended vacation in Europe, and had spent some time in Venice. After he returned home, he attended the first meeting of the Council, and talked on and on, about the beautiful gondolas on the canals of Venice.

★ ★ ★

He argued at great length, that the Council should buy gondolas, to put on the lakes of the city's parks, so as to help beautify the parks. He ended up his remarks by saying:

★ ★ ★

"Therefore, I move ye, that we buy 24 gondolas, and put them on



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the lakes in our parks, so that we may all enjoy their beauty."

★ ★ ★

Just then Mr. Sullivan got up and said: "Mr. Chairman: — I am very much in agreement with Mr. Murphy. I think it would be a wonderful thing to have 24 gondolas to help beautify the lakes in our parks, but let us not forget our duties as Councilmen. We were placed on this Council to administer the affairs of our City, as economically as possible. Therefore, I would like to make an amendment to Mr. Murphy's motion, to wit, that instead of buying 24 gondolas, we buy two, wan male, and wan female — and let Nature take its course."

★ ★ ★

Well, despite all of these optimistic opinions, and favorable signs of continued good business, we cannot simply sit back and let Nature take its course.

★ ★ ★

Our economy at its best is based largely on **created** human wants rather than "needs" or necessities.

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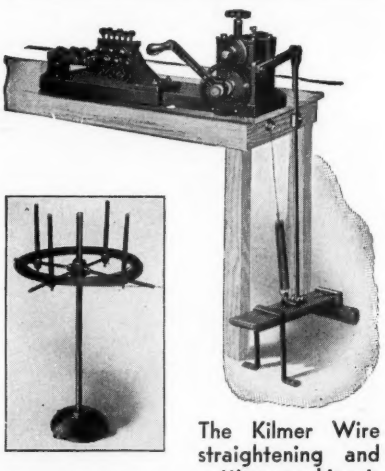

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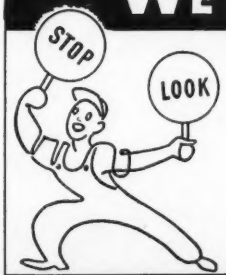

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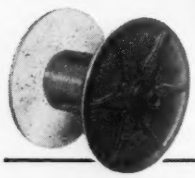

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★ ★ ★

We have the productive ability, the tools, and the materials of production, for at least one-third higher sales to consumers. We have the purchasing power, even after taxes; and in spite of past inflation — both in terms of current earnings and in a vastly increased backlog of savings — to **increase substantially** our standard of living.

★ ★ ★

By no means have we reached the saturation point in consumer markets. The moving up of fami-

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lies by income groups since 1940, would in itself open huge market potentials if the families moving up the scale in income groups were to take on the prewar living and buying habits of the group into which they move. Further, the basic changes in discretionary spending power, in total population, age distribution, births, education, family formation, urban living, out-of-date homes furnishings and equipment, and the pressing needs for new schools, roads, and hospitals, are creating hidden pressures for expansion that mean opportunity for an expanding market in both capital goods and consumer goods.

★ ★ ★

Selling faces a critical test right now. It has the opportunity to prove itself as a major economic force that can change consumers' habits and desires enough to provide markets for our production when our defense expenditures eventually drop off. It's been said that nothing happens until a sale is made — and that's right, for

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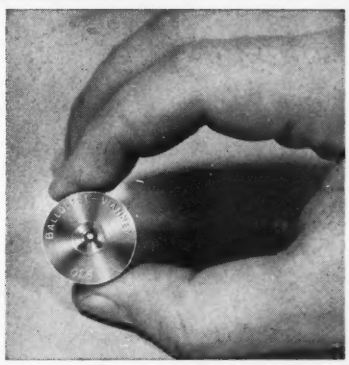

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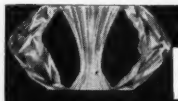

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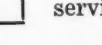
113 Colgate Avenue 

Buffalo 20, N. Y.

All of this indicates that, as defense spending slackens off in 1953 or 1954, we will have the basis for an unequalled peacetime prosperity, based on an increasing standard of living, backed up by our proved ability to produce.

★ ★ ★

I suggest, therefore, Gentlemen, that you restudy your products, packaging, marketing, advertising, and merchandising plans, as we are doing, and give to your salesmen the support, tools, inspiration and help needed to build a solid, continuing, big business. Depressions and prosperity are only relative to what we think and what we do about them. For the past twenty years the government tried to do something about them through government "controls." We shall probably have more in the future but I, for one, hope we, as businessmen, can do something to defend us from our more perverse selves. This something, in my book, is "selling."

Heads Research for Keystone West Coast Plant

The appointment of **A. Harry Dahlhauser** to director of research at **Wire Specialties Co.,** Santa Clara, California, a Keystone subsidiary, has been announced by **R. E. Sommer,** president and general manager of **Keystone Steel & Wire Company.**

★ ★ ★

The promotion, according to Mr. Sommer, is in recognition of Dahlhauser's achievement in product design. In the past year he has invented two building trades products now in production at Keystone, and has suggested others presently under consideration.

★ ★ ★

An employee of Keystone since September 13, 1939, Dahlhauser's first job with the company was as a laborer in the wire mills yard. He was transferred to the bundling department in 1941 and soon afterward was among the first group of Peorians inducted for military service under the 1940 Draft Act.

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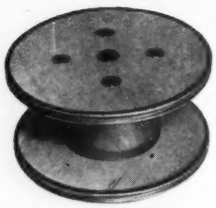

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Continuous Casting of Brass

(*Continued from page* 1195)

actual design, will be machines of the future whereby multiple strands will be cast at one time. Other ideas utilize the coupling of a continuous casting machine with a rolling mill, wherein the casting is immediately rolled to finished or semifinished stock. With changing ideas and production problems, continuous casting offers many advantages to the metal producer.

Signode Dedicates New Plant

Officials and friends of the **Signode Steel Strapping Company,** Chicago, gathered in Weirton, West Virginia, on October 22nd to dedicate the firm's new $1,500,000 plant, and to celebrate the company's 40th Anniversary. Heading the contingent from Chicago was **John W. Leslie,** Chairman of the Board, active head of the company since 1916.

★ ★ ★

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Correction on News Item

In the news item appearing in September, 1953, on pages 899 and 900, dealing with wire rope shipped to Jamaica, it should have been noted that the world's largest monocable tramway was designed and built by Ropeways Limited, 62, London Wall, London, E. C. 2, England.

Volco Brass Names Vice President

Norman Coates, president of **Volco Brass & Copper Company,** Kenilworth, N. J., has announced the appointment of **Robert J. Campbell** as vice president in charge of sales. Mr. Campbell was formerly general manager of the N. Y. Brass & Copper Company. Prior to that, he was associated with Bridgeport Brass Company in a sales capacity. Mr. Coates said that Mr. Campbell's 20 years' experience in the brass industry will be an invaluable asset to Volco's sales and customer relations. Mr. Campbell will make his headquarters at Volco's general sales office in Newark, N. J.

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Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelly Wire Die Corp., New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Pittsburgh Carbide Die Co., Monongahela, Pa.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc, New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Cochaud Wire Die Corp., New York, N. Y.
Continental Carbide Die Co., Lyndhurst, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Ft. Wayne Wire Die., Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., Elmet Div., Lewiston, Me.
Rayaloy Carbide Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Continental Carbide Die Co., Lyndhurst, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Rayaloy Carbide Corp., New York, N. Y.

DIES—Swaging
Rayaloy Carbide Corp., New York
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Dept. of General Electric Co., Detroit.
Continental Carbide Die Co., Lyndhurst, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS & TRAVERSES—Flange Steel
Entwistle, Jas. L. Co., Providence, R. I.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

DRYING EQUIPMENT
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S. Co., Fairfield, Conn.

ENGINEERS—Consulting
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.
Wire Insulating and Rubber and Plastics Processing—Halc and Kullgren, Inc., Akron, Ohio
Zinc—Imhoff, Wallace G., Co., No. Highlands, Calif.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio
Harper Electric Furnace Corp., Buffalo, N. Y.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Rockwell, W. S. Co., Fairfield, Conn.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F. Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engineering Co., The, Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Morrison Industries, Cleveland, Ohio
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, Detroit, Mich.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Resistance Heating, Strand
(See Annealing Machines)

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

GALVANIZING EQUIPMENT — (See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—for Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOOKS—Pickling & Liming
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

IMPREGNATING MATERIALS—
Solar Compounds Corporation, Linden, N. J.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INSULATING MATERIALS—
Belding Heminway, New York, N. Y.
Celanese Corporation of America, New York, N. Y.
Electronic Rubber Co., Stamford, Conn.
Glass Fibers, Inc., Toledo, Ohio
Heineman Corp., Oscar, Chicago, Ill.
Merrimac Paper Co., New York, N. Y.
Naugatuck Chemical Division of United States Rubber, Naugatuck, Conn.
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

INSULATING MATERIALS — Paper—For Electric Wire Cable
Merrimac Paper Co., New York, N. Y.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

LACQUERING SYSTEMS — See MACH.—Lacquering Electric Wire

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

LUMBER—Wire Mill, Carload shipments for lagging and car blocking
Canada Reels, Ltd., Bury, Que., Canada
North Anson Reel Co., No. Anson, Me.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Machine Works, Chicago, Ill.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Bolts & Rivets
Meyer, Roth & Pastor Maschinenfabrik (Cosa Corporation, New York, N. Y.), Koln-Raderberg, Germany

MACHINERY—Braiding
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Inc., Philadelphia, Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Machinery—Winding Wire)

MACHINERY—Chain Making
Meyer, Roth & Pastor Maschinenfabrik (Cosa Corporation, New York, N. Y.), Koln-Raderberg, Germany
Nilson, A. H. Machine Co., Bridgeport, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Closing Rope
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh.
American Insulating Mach'y Co., Phila., Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Mach'y Exch. (Used), New York.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.

MACHINERY—Diameter Testing Continuous
Standard Electronic Research Corp., New York, N. Y.

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. General Electric Co., Detroit, Mich.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelly Wire Die Corp., New York, N. Y.
Nord International Corp., Denville, N. J.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Dry Blending Plastics
Robinson Manufacturing Co., New York, N. Y.

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio

MACHINERY—Extruding
Aetna-Standard Engineering Co., Pittsburgh.
Davis-Standard Sales Corp., Mystic, Conn.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp. Cleveland, Ohio

MACHINERY—Forming Wire
Baird Machine Co., Stratford, Conn.
Lendt & Co., Inc., New York, N. Y.
Nilson, A. H., Machine Co., Bridgeport, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating Wire
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis-Standard Sales Corp., Mystic, Conn.
Ets. Pourtier Frères, Romainville, France
Fidelity Machine Co., Inc., Philadelphia, Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Inc., Philadelphia, Pa.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia.
Industrial Ovens, Inc., Cleveland, O.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Interlocking Fence Co., Morton, Ill.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Baird Machine Co., The, Stratford, Conn.
Glader, Wm., Machine Works, Chicago, Ill.
Meyer, Roth & Pastor Maschinenfabrik (Cosa Corporation, New York, N. Y.), Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

MACHINERY—Pin Making
Baird Machine Co., The, Stratford, Conn.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale and Kullgren, Inc., Akron, Ohio
Meyer, Roth & Pastor Maschinenfabrik (Cosa Corporation, New York, N. Y.), Koln-Raderberg, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Poultry Wire Fencing
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, O.

MACHINERY—Pre-Heater for Wire (for Extrusion of Plastics)
Industrial Ovens, Inc., Cleveland, Ohio
National Rubber Machinery Co., Akron, Ohio

MACHINERY—Re-Spoolers
Boyd & Sons Manufacturing Corp., Philadelphia, Pa.
Davis Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Providence, R. I.
National Mach'y Exch. (Used), New York, N. Y.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Rubber Insulating
Davis-Standard Sales Corp., Mystic, Conn.
National Rubber Machinery Co., Akron, Ohio
Royle, John & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spring Making
Carlson Company, The, New York, N. Y.
Lendt & Co., Inc., New York, N. Y.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany.

MACHINERY—Straightening & Cutting
Kilmer, M. D., & Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Medart Co., The, St. Louis, Mo.
Mettler Machine Tool Co., New Haven, Conn.
Meyer, Roth & Pastor Maschinenfabrik (Cosa Corporation, New York, N. Y.), Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
Maillefer S. A., Renens-Lausanne, Switzerland.
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Robinson Manufacturing Co., New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Sales Corp., Mystic, Conn.
Hale & Kullgren, Inc., Akron, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Marshall-Richards Machine Co., Ltd., Crook, County Durham, England
Robinson Manufacturing Co., New York, N. Y.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Co., Ltd., Crook, County Durham, England
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—for Wire Welding (See WELDERS—Butt and Spot)

MACHINERY—Winding Wire
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L., Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Hale & Kullgren, Inc., Akron, Ohio
Herborn, Herborn, Germany
Marshall-Richards Machine Co., Ltd., Crook, County Durham, England
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Wire Forming
Baird Machine Co., The, Stratford, Conn.
Kilmer, M. D., & Co., Cleveland, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Angier Corporation, The, Framingham, Mass.
Lendt & Co., Inc., New York, N. Y.
Marshall-Richards Machine Co., Ltd., Crook, County Durham, England
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Wean Equipment Co., Cleveland, Ohio

NAIL TOOLING—Tungsten Carbide
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Brothers, Inc., Cortland, N. Y.

NOZZLES—For Extruding Machines
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Cleveland, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

OVENS—Rod Bakers
Carl-Mayer Corp., The, Cleveland, Ohio
Morrison Industries, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Cleveland, Ohio

PAINT—Acid Proof
Ceilcote Company, Cleveland, Ohio
Nukem Products Corporation, Buffalo, N. Y.

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.
Solar Compounds Corp., Linden, N. J.

PAPER—Creped Wrapping
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS — (See COMPOUNDS — Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PICKLING—Hooks, etc. Acid Resisting
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

PICKLING TANK LININGS—
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio
Nukem Products Corporation, Buffalo, N. Y.

PIPES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

PLASTICS—for Wire Insulation
Naugatuck Chemical Division of United States Rubber, Naugatuck, Conn.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

PRESSES—Hydraulic and Mechanical
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio

REEL AND TENSION STANDS—
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Fidelity Machine Company, Inc., Philadelphia.
Industrial Ovens, Inc., Cleveland, Ohio
Kilmer, M. D., & Co., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Milton Machine Works, Inc., Milton, Pa.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Metal Bound
Canada Reels, Ltd., Bury, Que., Canada
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
McCaskie, Inc., Wm., Westport, Mass.
North Anson Reel Co., No. Anson, Me.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Lavendier, Charles, Co., Inc., Pawtucket, R. I.
McCaskie, Inc., Wm., Westport, Mass.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L. Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
Lavendier, Charles, Co., Inc., Pawtucket, R. I.
Mason Can Company, East Providence, R. I.
McCaskie, Inc., Wm., Westport, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
North Anson Reel Co., No. Anson, Me.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River Minn.
Lavendier, Charles, Co., Inc., Pawtucket, R. I.
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—(See Ovens—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Company, Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
American Steel & Wire Company, Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.

RUBBERS—for Wire Insulation
Naugatuck Chemical Division of United States Rubber, Naugatuck, Conn.

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Co., The, Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See Compounds—Wire Drawing)

SODIUM—for Descaling
Holden, A. F., Co., The, Detroit, Mich.

SPOOLS—(See Reels & Spools)

SPOOLS—Stamped Metal for Retail Wire Sales
Clark, J. L. Mfg. Co., Rockford, Ill.
Mason Can Co., East Providence, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Pickling and Plating
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Nukem Products Corporation, Buffalo, N. Y.

TESTERS — INSULATION (See MACHINERY—Spark Testers)

TESTING EQUIPMENT (See MACHINERY Testing, Physical and Diameter Testing)

TINNING PROCESS—
Metal & Thermit Corp., New York, N. Y.

TINSEL—Electric Conductor
Montgomery Co., The Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper, Silver and False Gold Coated, etc. (See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Machy—Power Transmission)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Pressed Steel Div., Republic Steel Corp., Niles, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

TUBE BENDERS AND FORMERS—
Kilmer, M. D., & Co., Cleveland, Ohio

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—for Electric Wire
N. E. Lacquer Co., E. Providence, R. I.
Solar Varnish Corporation, Linden, N. J.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Worcester, Mass.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIRE—Aluminum
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Malin & Co., The, Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.

WIRE—Barbed
Gerber, J., & Co., Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

WIRE—Brass
Chase Brass & Copper Co., Waterbury, Conn.
Spencer Wire Corp., Union, N. J.

WIRE—Brush
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, O.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Chase Brass & Copper Co., Waterbury, Conn.
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

WIRE—Flat, Fine
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Gerber, J., & Co., Inc., New York, N. Y.
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Forming
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.

WIRE—Galvanized
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Continental Steel Corp., Kokomo, Ind.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark, N. J.
North American Philips Co., Inc., Elmet Division, Lewiston, Me.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, O.
Spencer Wire Corp., Union, N. J.
U. S. Steel Co., N. Y., N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
American Steel & Wire Co., Cleveland, Ohio
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.
Spencer Wire Corp., Union, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Malin & Co., The, Cleveland, Ohio

WIRE—Oil Tempered
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Special Shapes
Charter Wire, Inc., Milwaukee, Wisc.
Continental Steel Corp., Kokomo, Ind.
National Lock Washer Company, The, Newark, N. J.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Steel—Also Coppered and Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Spencer Wire Corp., Union, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., Elmet Division, Lewiston, Me.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WRAPPING PAPER—Creped (See PAPER—Creped Wrapping)

YARNS & TAPES—
Belding Heminway, New York, N. Y.
Glass Fibers, Inc., Toledo, Ohio

YARN TESTERS—
Celanese Corporation of America, New York, N. Y.
Heineman Corp., Oscar, Chicago, Ill.
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE AND MASTICATING MACHINERY MANUFACTURERS

WATSON

TRACTOR CAPSTANS

PATENT PENDING

AS BUILDERS OF TRACTOR CAPSTANS FOR ALMOST TWENTY YEARS WE NOW OFFER OUR LATEST DESIGN WITH ADVANTAGES AND IMPROVEMENTS WHICH GO FAR BEYOND THE ORIGINAL SIMPLE REQUIREMENT TO HAUL CABLES, WIRE ROPE, HOSE POLES AND OTHER LINEAR PRODUCTS WITHOUT BENDS.

OUTSTANDING POINTS OF ADVANTAGE ARE:

1—*RAPIDITY* OF ALL ADJUSTMENTS WHILE IN OPERATION OR AT STANDSTILL.

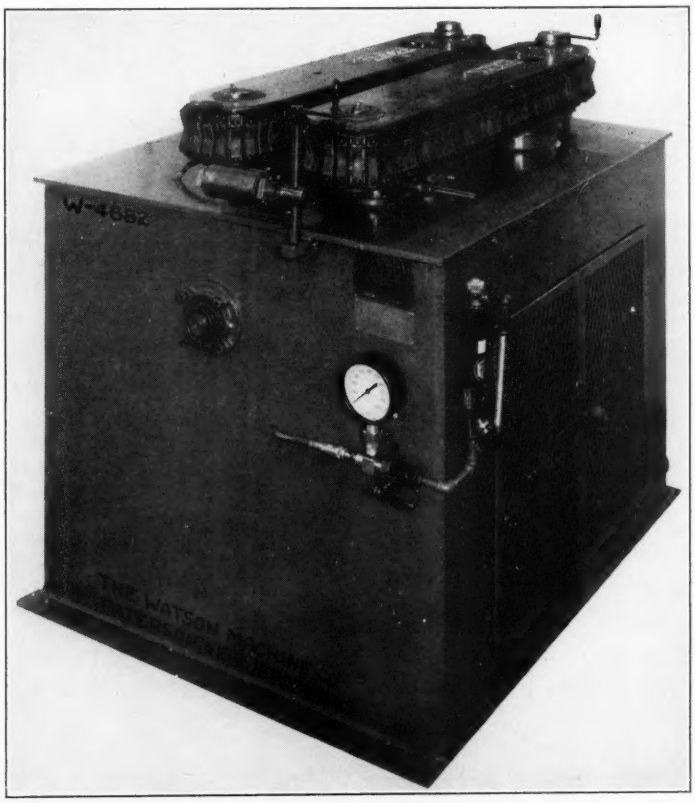
2—*EASE* OF UNOBSTRUCTED CABLE INSERTION OR REMOVAL AT A CONVENIENT OPERATING HEIGHT.

3—*SPACE SAVING* BY COMPACT DESIGN. PERMITS INSTALLATION OF HEAVY DUTY UNITS WHERE SPACE FOR LARGE SINGLE OR DOUBLE WHEEL CAPSTANS OF COMPARABLE HAUL PULL IS NOT POSSIBLE.

4—*HYDRAULIC* PRESSURE APPLICATION, WIDTH ADJUSTMENT AND RELEASE BY SIMPLE HAND PUMP AND VALVE OPERATION.

5—*READABILITY* OF ACTUAL PRESSURES AND HAUL PULL BY GAUGE AND TRANSLATOR.

6—*INTERCHANGEABILITY* OF TRACTOR FACINGS TO SUIT THE CONTOUR (SUCH AS SECTORS, ETC.) OF ANY PRODUCT AND A *VARIETY* OF FACING MATERIALS FROM SOFT RUBBER AND TEXTILE MATERIALS TO HARDENED STEEL OR TUNGSTEN CARBIDE FACINGS.



7—*AUTOMATIC* CENTERING BETWEEN AND SELF-ALIGNMENT OF THE TRACTORS.

8—*BOTH TRACTORS* ARE DRIVEN AND PRESSURE IS *UNIFORM* ALONG ENTIRE TRACK LENGTH.

9—*SPEED VARIATION* WITHIN REQUIRED RANGE IS *STEPLESS* BY HANDWHEEL AND INDICATOR DIAL, OR STEPPED BY MEANS OF CHANGE GEARS.

10—*SELF-POWERED* OR *LINE-SHAFT* DRIVEN TO SUIT USERS PARTICULAR REQUIREMENTS.

* * *

NOTE: THE PARTICULAR MODEL SHOWN HERE IS SELF-POWERED, FOR CABLES TO 4" DIA. AND CAPABLE OF HAUL-PULLS TO 3,000 POUNDS.

11-53

Remember

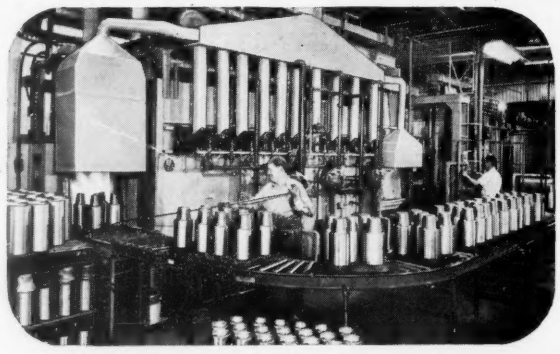
EF

builds
Gas, Oil and
Electric Furnaces

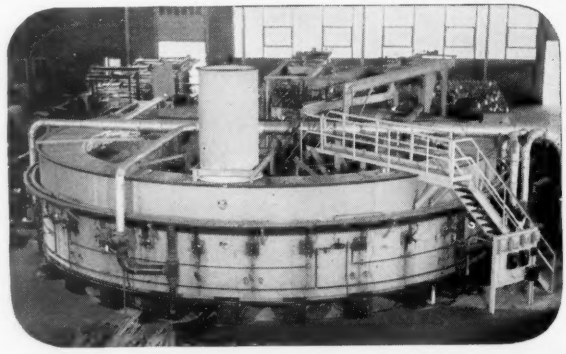
and recommends
without prejudice
the one that suits
your requirements
best!

Because we build all types of batch and continuous furnaces—in sizes to meet any production requirement—gas-fired, oil-fired, and electrically heated—we can recommend *without prejudice* the type—the size—and the method of heating—that suits all phases of *your particular* problem best.

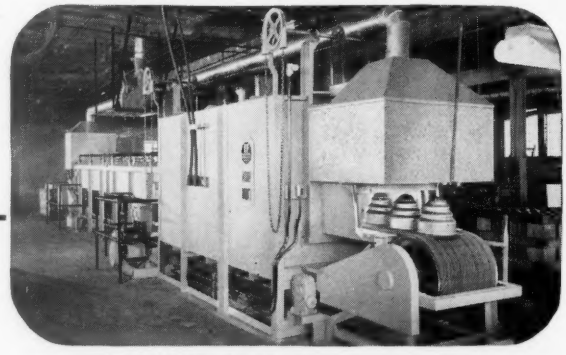
On your next annealing, brazing, hardening, solution treating, carbon restoration, carburizing or other heating or heat treating problem—investigate EF developments—available only in EF furnaces. We solicit your inquiries.



Gas-fired EF radiant tube continuous pusher-type furnace used for gas carburizing and other heat treating processes requiring several widely different cycles.



Oil-fired EF rotary furnace equipped with automatically controlled hydraulically operated charging and discharge mechanism —heats 35,000 lbs. of large billets per hour.



Electrically heated EF wire mesh belt conveyor furnace . . . for brazing, annealing, sintering, and other heat treating of aluminum, brass, copper and steel products.

EF

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

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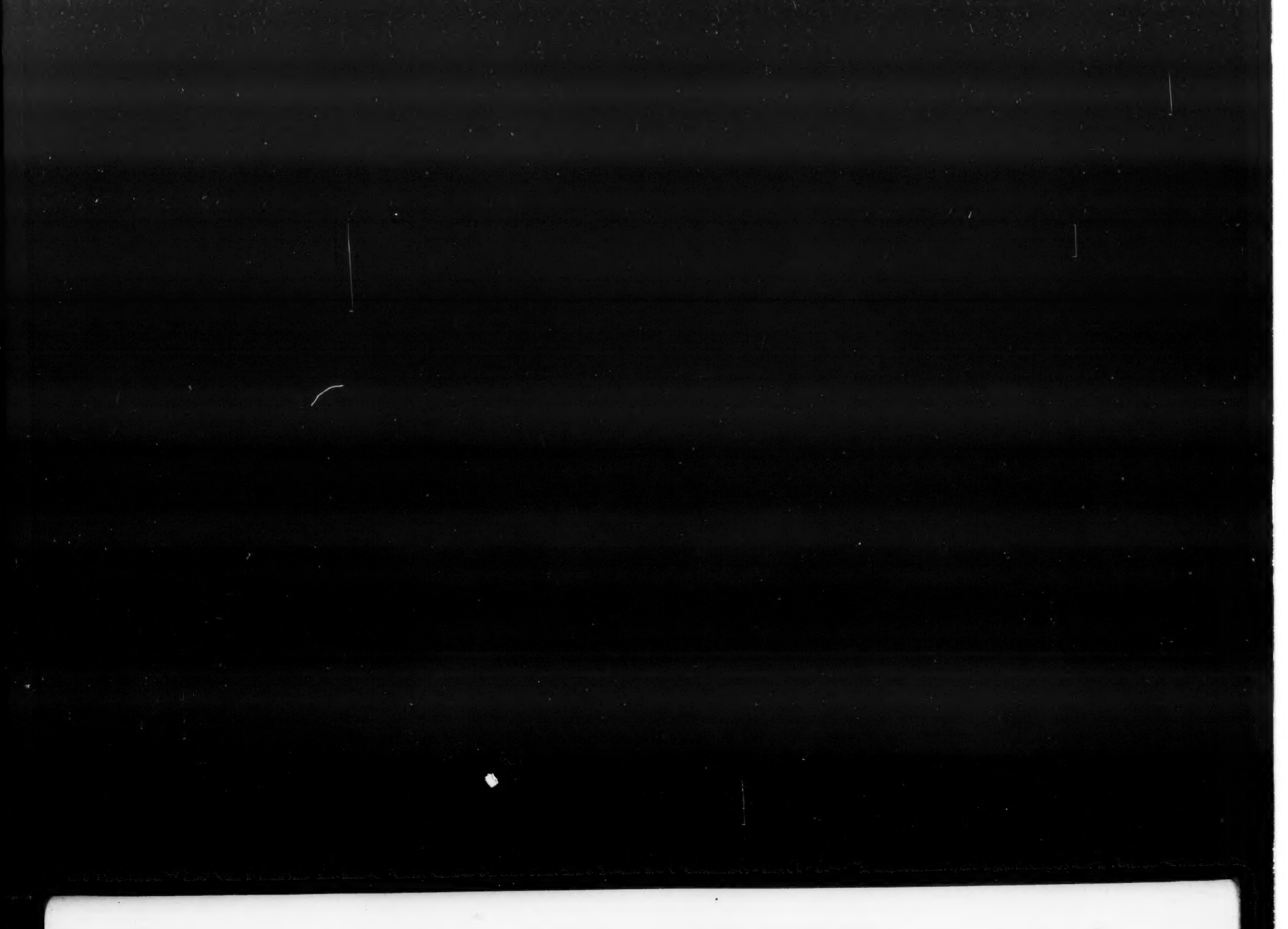
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